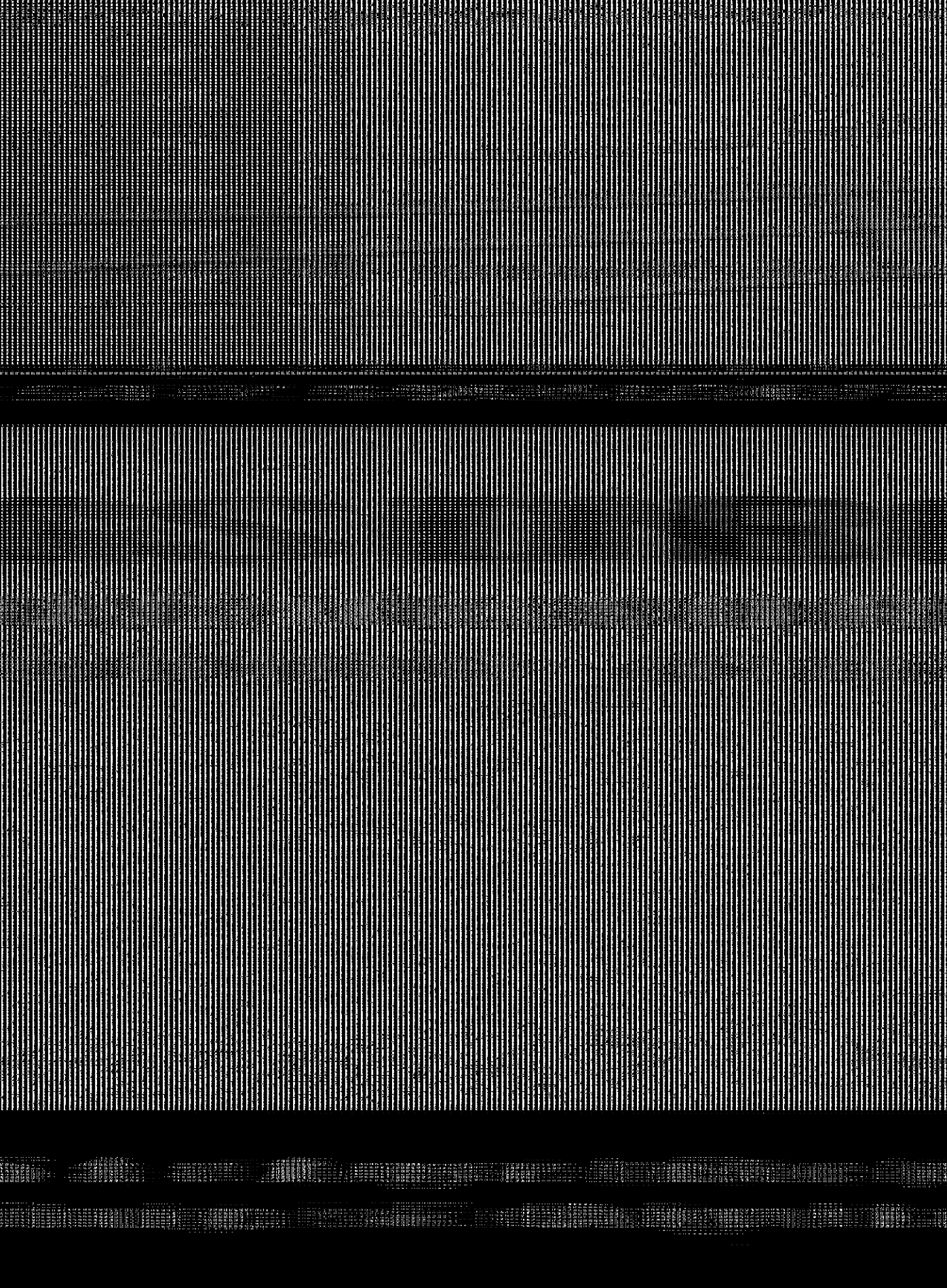

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SUMMARY

Depreciation of assets -- one of the costs of doing business -- rose steadily during 1949-59 and likely will continue to rise. Corporate agricultural marketing firms -- those handling food and kindred products and textile-mill products, food retailers, beverage manufacturers, and tobacco manufacturers -- more than doubled their dollar charges for depreciating assets in the 10 years. Increases were typical of all corporations in the U. S. economy.

Since World War II, dollars of depreciation have increased more rapidly than gains in total receipts but profits after taxes have declined. The total of the two (depreciation and after-tax profits) -- sometimes called total cash flow -- declined in the late 1940's and reached a low in the early 1950's. Since then total cash flow has increased for the agricultural industries.

When trends in depreciation, profits, and total cash flow are examined in relation to stockholders' equity rather than to total receipts, a different picture emerges. It is particularly noticeable if one looks at the entire 1939-59 period. Total receipts rose more than equity over those two decades. The combination of depreciation and profits, for most agricultural industries, trended upward relative to equity but remained steady to lower relative to total receipts.

Principal reasons behind the rising depreciation of assets in relation to total receipts of firms are: (1) a greater increase in the total costs of depreciable assets than in total receipts, and (2) an increase in the rate of writing off these assets, which was much more important than their higher costs.

The rate of writing off an asset depends on its estimated useful life and the method used in computing its depreciation over its service life. Declining service lives of assets accounted for the bulk of the rise in rate of write-off between 1946 and 1954. Through 1953, firms generally used the straight-line method for computing depreciation. Since 1954, firms have been using more rapid methods for computing depreciation. This was the big factor in pushing up the rate of write-off. Most prominent of the rapid methods are the declining-balance and the sum-of-the-years' digits.

Roughly one-sixth of depreciation in 1959 resulted from using rapid methods rather than the straight-line method. By 1963, this proportion is expected to have risen to about one-fifth.

In 1962, the Internal Revenue Service initiated a new policy regarding the useful life of depreciable property. Firms now have the option of depreciating assets individually, as typically done in the past, or by various classes. These new guidelines will likely increase further the rates at which assets are depreciated. The new investment tax credit, effective January 1, 1962, in effect lowers the price of long-lived equipment. The tax credit reduces current depreciation, but not significantly, compared with the upward thrust from firms adopting the new guidelines in determining service lives of property.

RISING DEPRECIATION OF ASSETS IN AGRICULTURAL MARKETING FIRMS

Some Causes and Implications

by

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INTRODUCTION

Depreciation charges of firms that process and market agricultural products increased steadily in postwar years. The rise in depreciation -- exceeding the increase in sales of these firms -- has taken an increasing share of the sales dollar. At the same time profits per dollar of sales have declined.

Such trends give rise to a number of questions regarding the functions of depreciation, the causes and economic effects of rising depreciation, and the relationship of depreciation to profits. The purpose of this study is to examine trends in depreciation in the last two decades, to isolate the forces behind the trends, and to explore a few of the implications of the findings. Changes in depreciation, for example, may affect costs and growth rates of individual firms and, in aggregate, total costs of industries that market agricultural products as well as the rate of growth and productivity of the national economy. Depreciation's direct effect on the profit account makes it of special concern.

There are many concepts of depreciation. As the primary element of capital consumption, depreciation is one of the costs of doing business. It is an imputed cost, the allocation of which varies by accounting conventions. Sometimes, there are differences between the amount of depreciation charged on tax statements and that reported to stockholders. Depreciation affects and is affected by investment planning by business firms. Investment decisions regarding future expectations are based, in part, on past experiences that are summarized in depreciation charges. In a profitable firm, depreciation provides an important source of funds to a continuing business enterprise. Also, it plays an important role in fiscal and monetary policies of the economy. Allocation of capital consumption is a major factor in affecting national financial accounts and tax liability. Such things as price-level changes and changes in the rate of adoption of technological advances can have wide economic repercussions through their effects on depreciation.

Emphasis is focused on depreciation as a cost of processing and distributing agricultural products. For this purpose, comparisons of depreciation are made with total receipts, both over time and among industries. The increase over time in depreciation per dollar of total receipts is analyzed. How much of the rise was due to an increase in depreciable assets in the postwar expansion? How much was caused by rising obsolescence? Or, to what extent was the rise caused by the switch to using the rapid methods of depreciation authorized for tax purposes starting in 1954? This analysis focuses on these questions. Effects of inflation in this report are minimized by using ratios of dollar amounts.

After the various forces affecting depreciation are isolated, some of the implications of the rise are examined. Rising obsolescence, increasing costs of maintenance as an asset gets older, and declining present value of a dollar of income as it is deferred into the future all complicate the evaluation of depreciation as a cost.

The rise in depreciation is examined by making comparisons with profits in terms of sales and owners' equity. Both depreciation and after-tax profits (total cash flow) accrue to the ownership of a firm. To farmers and consumers interested in efficiency throughout the marketing system, a distinction between profits and depreciation of marketing firms may be unimportant. Both are costs of moving farm products to the retail market. Evaluation of cash flow as a market performance criterion abstracts from the difficult problem of allocating capital consumption. This advantage has increased in importance in postwar years during which depreciation has increased rapidly because of changes in tax laws and their administration. However, analyses must not equate total cash flow and profits. Allowances must be made for variations among industries in capital consumed, for changes over time, and for substitutions of capital for other inputs.

Comparisons are made of new purchases of depreciable property and cash flow less dividends. Total cash flow comprises a major source of funds available to a firm for new purchases or other purposes. As a result, changes in cash flow may affect financial decisions of firm managers, stock owners, and in aggregate, the economy. Nevertheless, external sources of funds are available from a wide variety of sources when sound investment opportunities are recognized.

DEPRECIATION AND CAPITAL CONSUMPTION

Capital consumption consists of the current value of all capital used in the production process during a given accounting period. It is comprised of the total loss of value of fixed capital assets owing to use and obsolescence (9, pp. 7-20). 1/ The major component of capital consumption usually is depreciation of depreciable assets. Rent, repairs, maintenance costs, and capital expenditures charged to current operations are components of capital consumption not depreciable. Capital consumption is distinct from changes in the capital account owing to revaluations, changes in discount rates, or catastrophic destruction. These things affect the capital account but are not functions of the production process.

1/ It sometimes is argued that obsolescence does not affect the capacity for current production so does not constitute capital consumption. Obsolescence then can be treated as an adjustment of the capital account at the time of retirement (6, pp. 242-46). But obsolescence may lead to a reduction in use of older assets in favor of more modern equipment. This disuse of capacity raises average capital costs, but allocation problems remain. In measuring capacity or productivity, gross capital stock minus retirements may be preferable to using gross capital stock less depreciation as is usually done (10, p. 71 and 19, p. 395).

Numbers in parentheses refer to Literature Cited, p. 38.

Trends in Depreciation

Corporations that market agricultural products more than doubled their depreciation (including amortization and depletion) between 1949 and 1959 (table 1). 2/ Retail food corporations had the greatest increase. They more than tripled depreciation; textile-mill products, on the other hand, failed to double. Beverage manufacturing, food and kindred products, and tobacco manufacturing fell between these two extremes. These rising costs were typical of corporations in the rest of the economy. The all-industry group tripled depreciation between 1949 and 1959, after more than doubling depreciation between 1939 and 1949 (14).

In 1959 depreciation, depletion, and amortization of sole proprietorships and partnerships totaled $77 million for food and kindred products plus beverages, $251 million for retail food, and $9,329 million for all industries (26). Corporations accounted for 92 percent of total depreciation charges for food and kindred products plus beverage manufacturing, 51 percent for retail food, and 73 percent for all industries.

Increases in depreciation costs took place during a period of rapidly rising receipts, partly due to inflation. Relative to total receipts, depreciation in each of the industries declined approximately one-half during World War II, but since then has grown steadily (fig. 1). 3/ By 1959, each of the industries except retail food and

2/ Industries that market agricultural products included in this study are food and kindred products (other than beverage manufacturing), retail food, beverage manufacturing, textile-mill products, and tobacco manufacturing. They are referred to as "agricultural industries," and are compared to the average of all industries in the economy as a norm. Some sectors of the economy, such as utilities and finance, do not provide comparable comparisons with the agricultural industries. However, the inclusion of retail food extends the requirement beyond manufacturing. Desire for a broad base and comparability with many data series led to use of all industries.

The year 1959 includes data from firms with accounting periods ending July 1959 through June 1960. The 1958 and 1959 data are not entirely comparable with earlier data because of a change in industry classification. The major change in the agricultural industries was a transfer of 2,277 milk product firms from retail food into the food and kindred products industry. Depletable and intangible assets were not reported separately from depreciable assets between 1940 and 1953. Partly for this reason they have been included throughout the period under study. Amortization and depletion likewise were added to depreciation.

3/ Throughout this report "total compiled receipts," as defined by Internal Revenue Service, is used in place of sales. Total receipts is preferable in the sense that it includes all receipts from the assets owned by the firm, both those generated outside and inside the main operation of the firm. Rental income, for example, represents depreciable assets not used in operations. Gross sales of all industrial corporations in 1957 (not reported for 1958 or 1959) amounted to 79 percent of total compiled receipts (22). Ratios of dollar values are used extensively in this report. One of the primary reasons is to minimize effects of inflation. However, price-level changes may alter the two parts of a ratio to different degrees, thereby introducing a bias. Despite this possibility, ratios were deemed preferable to deflation of asset and depreciation series because of the unknown time-mix of asset purchases and the use made of the results. Existing deflated series assume stable depreciation rates -- straight-line method of depreciation and no change in length of lives of assets (1, app. A, and 10). These are crippling assumptions to a study of changes in methods of depreciation and changes in length of asset lives. Emphasis will be placed on cost comparisons and effects on total cash flows so current rather than deflated prices are relevant.

Table 1.--Depreciation charges of corporations that market agricultural products compared with the all-industry average, 1939, 1949, and 1959 1/

Industry	1939	1949	1959	Percentage increase 1939 to 1949	Percentage increase 1949 to 1959
	Million dollars	Million dollars	Million dollars	Percent	Percent
All industries in U. S.	3,805	8,521	25,299	124	197
Food and kindred products	136	292	750	115	157
Retail food	37	80	264	116	230
Beverage manufacturing	37	84	194	127	131
Tobacco manufacturing	8	11	35	44	211
Textile-mill products	90	168	311	87	85

1/ Includes amortization and depletion.

Source: Tables 13-18.

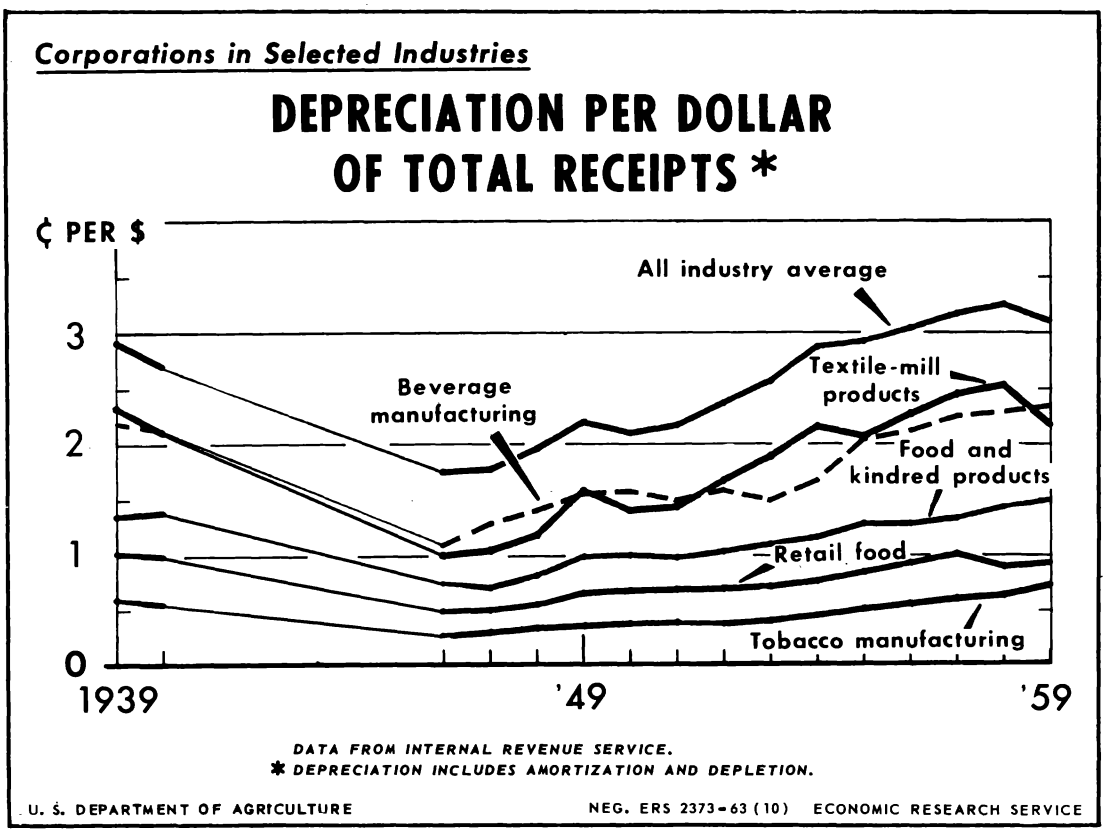

Figure 1

textile-mill products exceeded by a small amount the level of depreciation, relative to total receipts, from which it declined in 1939. These fluctuations did not materially influence the relationships existing among industry groups since each was affected by about the same amount.

Differences among industries in depreciation per dollar of total receipts are explained, largely, by variations in value added and amount and kind of depreciable assets necessary to generate a dollar of receipts. Some industries, such as retail food, rent a substantial part of their long-term capital in the form of land and buildings, thereby reducing the amount of depreciable assets owned by the industry (11). Few depletable or amortizable assets are found in agricultural industries, so depletion and amortization added to depreciation help to raise the all-industry average above that of the agricultural industries.

The postwar rise in depreciation relative to total receipts was an element in the increase in the farm-retail marketing margin for food that occurred during the same period. Between the postwar low and 1959, corporations that process food and kindred products increased depreciation costs by 0.8 cent per dollar of total receipts, a rise of 110 percent. The increase for corporate beverage manufacturing was 1.3 cents (115-percent rise) and for retail food corporations 0.4 cent (90-percent rise). 4/ The effect on the marketing margin was little greater in 1959 than it was before the war. However, the existence of a persistent upward trend since the late 1940's may carry depreciation per dollar of receipts continually higher in the future. A look at the reasons for the rise in depreciation aid in this projection.

Depreciation as a Cost of Doing Business

Particularly since the advent of income tax, depreciation has been recognized as a cost of doing business. Depreciation is peculiar as a cost in that it is an accounting charge made against income of a firm; no current cash outlay is required. Failure to charge it against income results in an overstatement of profits and a dissipation of capital in the form of taxes and dividends.

Depreciation is the means of allocating the cost of a past-acquired asset with a useful life exceeding the length of a single accounting period. Depreciable assets are durable assets treated in accounting as prepaid expenses. Original cost minus salvage value is the appropriate sum to allocate over the life of the asset. Imputation of cost is designed to coincide with useful service life and ebbing value of the asset. 5/

The full cost of an asset is the original cost plus compound interest on invested funds until written off by depreciation. Interest cost are recognized only when money is borrowed for the purchase, but even then are not related to the capital account. Its relevance is appreciated in analyzing the value of rapid depreciation, which reduces this cost. It is analogous, inversely, to the situation where the present value of an asset includes the return from it in each future time period discounted to the present rather than merely added into a total. When an asset is purchased with internally-generated funds, an implicit interest cost still accumulates during the period of

4/ No attempt is made here to conform to the definitions used in computing the farm-retail marketing margin for food products originating on U. S. farms.

5/ Even using the revised guideline service lives for depreciable property authorized by Internal Revenue Service in 1962, the basic concept of depreciation for tax purposes provides that retirement and replacement practices be consistent with the life used in computation (24, p. 4). The reserve ratio test was provided for this purpose. See section on new guideline service lives, p. 33.

depreciation. It often is viewed as an opportunity cost, but rarely tabulated. It is offset by implicit interest income, so in total the expense and income are balanced. Nevertheless, failure to recognize them explicitly understates total capital costs and income from funds invested within the firm.

Measurement Problems

Simplified costing-out practices of accountants result in depreciation charges that may not conform very closely to actual loss of value over time. Increasing costs of maintenance, the declining value of a dollar over time, and the rapid adoption of new technology are major factors ignored in the straight-line method of depreciating. Rapid methods of depreciation represent an attempt to overcome these problems, but inadequate knowledge and variations among assets preclude precise measurement.

Changing price level distorts the correspondence of depreciation and capital consumption. Inflation yields a monetary windfall (price-level adjustment) to the owner of "real" assets. This windfall is not regularly tabulated using conventional accounting procedures. But if a market transaction occurs, capital gains are taxable even if due to price-level changes alone. The used purchase price of a durable good then is depreciable to the purchasing firm.

The extension of service life by adding repairs complicates the costing-out problem. The line between capital improvements that are depreciable and repairs chargeable to current account is difficult to define. Because of the value of quick asset write-offs, there is an incentive to charge outlays to repair accounts whenever possible.

Renting is another method of obtaining the use of depreciable assets. Rent covers both an element of capital consumption and interest on the value of the capital embodied in the asset. It is equivalent to purchasing with debtor capital -- depreciation is charged against income as well as interest paid to the creditor. The allocation of rent payments between depreciation and interest involves assumptions about the average length of service life of the rented assets, the interest rate used by the lessor in arriving at the rental charge, and the remaining salvage value of these assets to the lessor at the expiration of the rental contract (11). 6/ Rental income is mostly offset by charges for depreciation and income expense by the lessor, so total depreciation for all industries will contain the depreciation component of rent that is hidden for firms or industries. This aggregation causes depreciation rates for the all-industry average to exceed the weighted average of the industries taken separately.

FORCES BEHIND THE RISE IN DEPRECIATION

The various components of depreciation are studied to determine the importance of each in pushing up depreciation costs in the last two decades. Particular emphasis is placed on explaining trends in depreciation per dollar of total receipts, so the effects of changes in depreciation on margins can be assessed. In a later section,

6/ Bonafide rental agreed upon by two parties to a rental contract is prima-facie evidence for tax purposes of the amount of capital being consumed plus interest paid in a given time period. This ability to write-off the cost of an asset within the term of a rental contract rather than perhaps a much longer period required if the comparable asset were owned represents one of the principal advantages of renting. Inflationary windfalls still accrue to the lessee by means of the contract, but replacement is less of a problem because financing is arranged by the lessor.

comparisons are made between depreciation and profits using both total receipts and stockholders' equity as points of departure.

Depreciation has been rising in postwar years because of (1) an increase in total costs of depreciable assets, and (2) a rise in the rate of writing off these assets. 7/ The rate of write-off is a function of (1) the method of depreciation used, and (2) the estimated useful service life of each asset. A change in average service life, in turn, can result from (1) shorter average service lives of depreciable assets over time, or (2) a switch in composition of assets from longer to shorter lived assets. This switch can be the result of a change in timing of purchase of various sorts of assets, the use of more or fewer repairs, or a change in policy of renting vs. owning depreciable assets. Observed changes in the period studied were stimulated by changes in tax laws and their administration.

Increase in Depreciable Assets Approximates Rise in Receipts

Gross depreciable assets (fixed durable capital minus land) more than doubled in all industries between 1939 and 1959 (fig. 2). Only a small increase occurred during World War II because of a general shortage of materials. But a rapid rise, reflecting industry growth and adoption of new technology, took place after 1946. Total depreciable assets increased at uniform rates among industries between 1946 and 1959. 8/ The average annual percentage rate of increase in these assets for all industrial corporations exceeded that of any of the agricultural industries except retail food. 9/

Since 1939-59 was an inflationary period, the rise in quoted value of assets partly represents a change in valuation of a given stock of physical assets. Timing of purchase and differences in average asset lives and rates of incorporation are some of the reasons for variations among industries.

7/ In addition, certain problems of industry classification and numbers of corporations confuse the data. Between 1939 and 1959, the number of corporations filing income tax returns with balance sheets (upon which the depreciation data are based) increased 160 percent for the all-industry group, 174 percent for retail food, 73 percent for food and kindred products, 24 percent for textile-mill products, 5 percent for beverage manufacturing and declined 26 percent for tobacco manufacturing. Since corporate firms may have previously existed as nonincorporated firms, generalizations from corporation data covering longtime periods may not hold for entire industries. Partly for this reason, depreciation (and later profits) is examined as ratios of total receipts and stockholders' equity.

8/ These data based on actual IRS tax returns are somewhat at variance with Commerce data that are built up by prorating annual purchases over time using fixed asset lives. On a deflated dollar basis, they show gross stocks of fixed business capital increasing steadily over most of the postwar years but the rate of increase tapered off significantly in recent years. The declining rate is attributed primarily to equipment rather than structures (12, pp. 11-14).

9/ The geometric average percentage rates of increase in 1946-59 by industry were food and kindred products, 6.4; retail food, 12.3; beverage manufacturing, 7.0; tobacco manufacturing, 5.2; textile-mill products, 4.6; and, the average of all industries in the U. S., 8.0 percent. A change in industry classification shifted sizable amounts of assets among certain industries between 1957 and 1958. For that reason, percentages based on the 1946-57 period for food and kindred products (5.9 percent) and retail food (14.2 percent) may be more meaningful than the rates for 1946-59.

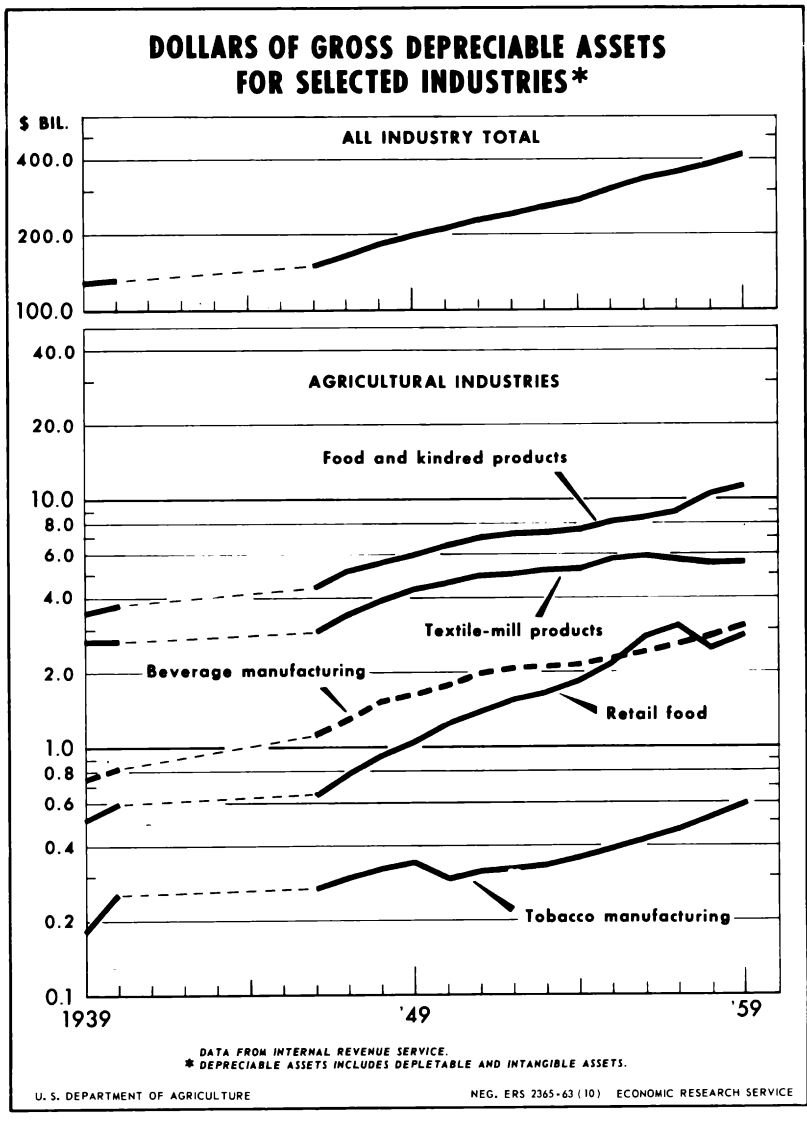

Figure 2

The wholesale price index reported by the Bureau of Labor Statistics for all industrial commodities (other than farm products and foods) rose 121 percent between 1939 and 1959. As a result, new purchases during the period were valued higher than comparable physical assets purchased earlier and of longer duration. This price-level problem can not be easily solved because of the unknown time sequence of purchases. An industry such as retail food with the bulk of its depreciable assets in equipment with relatively short service lives and with few buildings will replace its stock of depreciable capital more frequently. Thereby, it maintains relatively more up-to-date valuations than an industry such as textile mills with heavy investments in long-lasting equipment and relatively more buildings.

Gross depreciable assets as a ratio of total receipts declined substantially during most of the 1940's (fig. 3). Gross depreciable assets increased during the period, but total receipts rose considerably more. In the 1946-59 period, the ratio

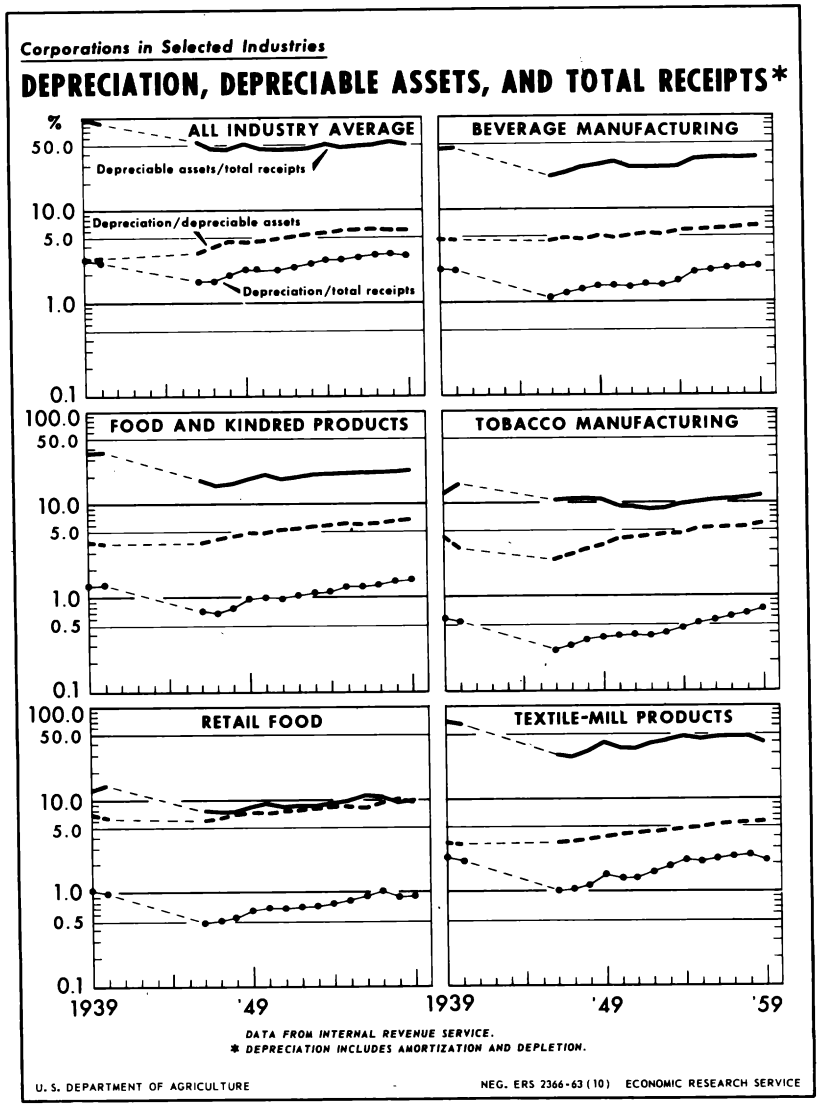

Figure 3

for each of the industries trended slightly upward. 10/ Assets and total receipts both rose rapidly so the ratio of the two did not change dramatically in most of the industries compared. By 1959, none of them had recouped the downtrend that occurred during the 1940's.

Rising price levels likely will be more quickly reflected in total receipts than in the total stock of depreciable assets. Thus, inflation during the 1940's contributed to the rapid decline in assets per dollar of total receipts. Relative stability in wholesale prices of nondurable goods since that time helped keep the ratio below prewar levels. But rising prices of durable goods probably was responsible for the mild postwar rise in depreciable assets per dollar of total receipts. Over the entire two

10/ The geometric average annual percentage rates of increase in 1946-59 in gross depreciable assets per dollar of total receipts for corporations by industry are as follows: Food and kindred products, 1.7; retail food, 2.2; beverage manufacturing, 2.9; tobacco manufacturing, 0.9; textile mill products, 4.3; and, average of all industries in the United States, 0.6 percent.

decades, inflation probably affected total receipts and depreciable assets to approximately the same degree. 11/

Rising Rate of Asset Write-Off

A division was made in the 1946-59 geometric average annual rate of increase in depreciation per dollar of total receipts. 12/ Most of the increase was explained by the rise in depreciation per dollar of gross depreciable assets, that is, the rate of asset write-off, except in the case of beverage manufacturing (fig. 3 and table 2). Postwar upturns in gross depreciable assets per dollar of total receipts provided the balance of the stimulus to depreciation per dollar of total receipts. It was only a small part of the total rise for tobacco manufacturing and the all-industry average.

Similar reasoning explains the increase in depreciation per dollar of stockholders' equity. The ratio of depreciable assets to equity increased over the 1946-59 period for all industries. The increase was greater for the agricultural industries, other than tobacco and textile mills, than for the all-industry average. 13/ The increase in depreciation per dollar of equity exceeded the increase in depreciation per dollar of gross depreciable assets in all industries compared (table 3).

The bulk of the decline in depreciation per dollar of total receipts between 1939 and 1946 was due to the drop in assets per dollar of total receipts (fig. 3). 14/ Little change was found in this period in the rate of asset write-off, except for tobacco manufacturing.

11/ A price deflator by Creamer (2) for fixed capital stock increased by 112 percent between 1937 and 1957 compared with a 105 percent rise for the output deflator. Between 1947 (the year of earliest data) and 1959, the wholesale price of nondurable goods reported by BLS increased by only 10 percent while the price of durable goods increased 59 percent. Creamer's price deflators for the stock of fixed capital in the food and kindred products industry increased 50 percent between 1948 and 1957, but only 3 percent for deflators of output (2, table G-4, p. 85). Creamer's assumptions of stable depreciation rates and length of lives of assets reduces confidence in his deflators but they are indicative of trends.

12/ $D/R = (D/A)\ (A/R)$ where D = depreciation, R = total receipts and A = gross depreciable assets. When $y = uv$ and x = time, then

$$\frac{\Delta y}{\Delta x} = \frac{u\Delta v}{\Delta x} + \frac{v\Delta u}{\Delta x} + \frac{\Delta u \Delta v}{\Delta x}, \text{ and } \frac{\Delta y}{y\Delta x} = \frac{\Delta v}{v\Delta x} + \frac{\Delta u}{u\Delta x} + \left(\frac{\Delta u}{u\Delta x}\right)\left(\frac{\Delta v}{v\Delta x}\right).$$

Substituting D/R for y, D/A for u, and A/R for v and letting $\Delta x = 1$ year, then,

$$\frac{\Delta (D/R)}{D/R} = \frac{\Delta (A/R)}{A/R} + \frac{\Delta (D/A)}{D/A} + \left(\frac{\Delta (A/R)}{A/R}\right)\left(\frac{\Delta (D/A)}{D/A}\right)$$

(16, note 3, pp. 31-36).

13/ The all-industry average increased 17, food and kindred products 40, retail food 57, beverages 31, tobacco manufacturing 17, and textile mills 13 percent.

14/ Between 1939 and 1946, the annual average decline in depreciation per dollar of total receipts ranged from 7.6 percent for all industries to 12.7 percent for tobacco and textiles. The decline in assets per dollar of total receipts accounted for approximately the following percentages of the total declines in depreciation per dollar of total receipts: All-industrial average, 125 (offsetting the rise in write-off); food and kindred products, 99; retail food, 75; beverage manufacturing, 88; tobacco manufacturing, 32; and, textile mills, 100 percent.

Table 2.--Distribution of the 1946-59 geometric average annual rate of increase in depreciation per dollar of total receipts 1/

Industry	Depreciation per dollar of gross depreciable assets (rate of write-off)			Gross depreciable assets per dollar of total receipts	Interaction	Total depreciation per dollar of total receipts
	Total	Attributed to -- Rapid methods	Reduced average lives			
	Percent	Percent	Percent	Percent	Percent	Percent
All-industry average	88	32	56	11	1	100
Food and kindred products	68	28	40	31	1	100
Retail food	58	26	32	41	1	100
Beverage manufacturing	46	25	21	53	1	100
Tobacco manufacturing	87	32	55	12	1	100
Textile mills	59	21	38	39	2	100

1/ Allocation of major division based on procedure in footnote 12. Breakdowns of depreciation per dollar of gross depreciable assets are based on estimates of the proportions of depreciation in 1959 attributed to use of rapid methods, described in the appendix.

Table 3.--Geometric average annual increase in depreciation, 1946-59

Industry	Depreciation ÷ total receipts	Depreciation ÷ gross depreciable assets	Depreciation ÷ stockholders' equity
	Percent	Percent	Percent
All-industry average	5.2	4.7	5.9
Food and kindred products	5.5	3.7	6.0
Retail food	5.4	3.1	6.8
Beverage manufacturing	5.5	2.5	4.3
Tobacco manufacturing	7.5	6.6	7.3
Textile mills	7.4	4.3	6.9

Source: Computed from tables 13-18.

It was pointed out that over the entire two decades, 1939-59, inflation probably affected the stock of depreciable assets, and hence depreciation, about as much as it did total receipts. For this reason, a look at the components of depreciation per dollar of total receipts may be useful. However, variations within the period are probably more meaningful for projection and understanding of current underlying forces.

Annual average rates of change in depreciation per dollar of total receipts between 1939 and 1959 were for each of the industries within a range of plus or minus 1 percent per year (comparing end years, not fitted trends). This near stability resulted from the offsetting declines in assets per dollar of total receipts and increases in depreciation per dollar of depreciable assets. 15/ The rapid rise in rate of asset write-off since 1946, in general, compensated for the wartime decline in gross depreciable assets per dollar of total receipts. All agricultural industries participated in the rise in write-off but only tobacco manufacturing rose more rapidly than did the all-industry average.

The rate of write-off of depreciable assets depends on the estimated useful service life of each asset and the method used in allocating depreciation over the life of the asset. These two components each are examined to see why the rate of write-off increased so much and at such steady rates between 1946 and 1959.

Changes in Methods of Depreciation

Through 1953, the straight-line method of depreciating assets was the method generally acceptable to the Bureau of Internal Revenue and in general use. The 1954 Internal Revenue Code allowed considerable latitude to firms in selecting the method of depreciation on new assets purchased after December 31, 1953. In addition to the old straight-line method, declining-balance, sum-of-the-years' digits, unit-of-production, or any other consistent method was allowed as long as the method selected did not result in accumulated allowances in excess of that computed under the declining-balance method. 16/ The declining-balance method was restricted to a rate

15/ The annual average rates of change between 1939 and 1959 (comparing end years) are as follows:

Industry	Depreciation per dollar of total receipts (percent)	Depreciation per dollar of gross depreciable assets (percent)	Gross depreciable assets per dollar of total receipts (percent)
All-industry average	+0.3	+3.7	-3.4
Food and kindred products	+ .5	+2.6	-2.1
Retail food	- .5	+1.3	-1.8
Beverage manufacturing	+ .3	+1.2	- .9
Tobacco manufacturing	+1.0	+1.5	- .5
Textile-mill products	- .4	+2.7	-3.0

16/ Sum-of-the-years' digits provides for taking, in inverse order, the ratios of cost obtained by dividing each digit comprising the number of years useful life by the sum of all of the digits in the useful life. For example, an asset with a 5-year life can be charged off 5/15 or 1/3 of the cost in the first year, 4/15 of the cost in the second year, followed by 3/15, 2/15, and 1/15. Mathematically, the method allows depreciation equal to $\frac{2N}{N(N+1)}$ times cost in the first year, where N is the estimated useful life, $\frac{2(N-1)}{N(N+1)}$ times cost the second year, $\frac{2(N-2)}{N(N+1)}$ the third year, etc.

Units-of-production method, used principally by the petroleum industry, allows depreciation to be charged off on the basis of output. This method and miscellaneous methods accounted for less than 2 percent of all depreciation charged by any of the agricultural industries and less than 4 percent for all industries in 1959.

equal to twice the straight-line method on new assets acquired after December 31, 1953, often called double-declining-balance. On used assets or assets acquired before 1954 use of the declining-balance method was limited to 150 percent per year. A switch from declining-balance to straight-line was authorized to cut off a never-ending tail that otherwise would persist.

Estimated salvage value must be deducted from cost in computing straight-line and sum-of-the-years' digits but not in the declining-balance method. Accumulated depreciation can never exceed cost minus salvage.

In the Small Business Tax Revision Act of 1958, an additional charge of 20 percent was authorized during the first year of use on new personal tangible assets having a useful life exceeding 6 years. A $10,000 limit per consolidated firm was placed on the assets eligible for this deduction. It can be used in conjunction with any of the authorized rapid depreciation methods. Additional first year depreciation was designed to benefit small businesses but applies to all sizes of firms. Because of the $10,000 limitation, it is insignificant in affecting total depreciation costs of industries.

About one-half of the cost of an asset is written off in one-third of the service life when using either the sum-of-the-years' digits or double-declining-balance method (7, p. 596). The more rapid of these two methods depends on the length of service life of the asset and the remaining salvage value expected. When service life is 5 years or less, and zero salvage, or when salvage exceeds 13.5 percent of cost, regardless of service life, double-declining-balance is the more rapid method of depreciation. Assets with service lives longer than 10 years and with low salvage value (about 4 percent) are more quickly written off using the sum-of-the-years' digits method (15).

Choice among these two methods for intervening combinations of service lives and salvage values involve discounting the value of future returns to the present (5). High discounting rates favor use of the declining-balance over the sum-of-the-years' digits since the write-off is faster in early years using the declining balance. For example, an asset with a 10-year service life and 6-percent salvage is more quickly written-off using the sum-of-the-years' digits if the appropriate discount rate is below 10 percent. If the rate is higher, declining-balance is faster (5).

Adoption of rapid methods.--The value of a rapid method depends on the present value of a future income stream, assuming income tax rates remain unchanged. Increasing depreciation charges during the early years of an asset's life decreases pretax earnings, taxes, and after-tax earnings while increasing total cash flow. Deferring taxes is equivalent to a loan for the period of the deferral. During this period, the firm runs the risk of paying a higher rate of income tax so the gain can be offset by rising taxes but taxes may be decreased, decreasing total future liability. Also, failure to depreciate rapidly, when in fact it is justified in terms of capital consumption, amounts to a loss totaling the difference in depreciation with interest until the time of recovery. It raises the effective cost of the asset.

Many firms compute taxes on the basis of rapid methods but use the straight-line method for reports submitted to stockholders. 17/ A deferred tax account makes

17 / A 1960 Treasury Department survey showed 39 percent of 1,918 large corporations compute depreciation differently for tax and internal use. Less depreciation was taken for internal uses than tax by 28 percent of them. The other 11 percent charged off more depreciation internally than allowed by IRS (23, p.6).

up the difference between the two methods of accounting when depreciation for tax purposes is more than taken internally. The best of two worlds thereby often is attained: Taxes are reduced by using rapid methods on tax accounts, while incomes reported to stockholders remain high by using straight-line depreciation on financial reports (see appendix). This practice keeps alive the issue of whether the rapid methods of depreciation are in fact justified by capital consumption.

Many firms have used the rapid methods of depreciation. Nearly two-fifths of the depreciation claimed by all industrial corporations for tax purposes in 1959 was based on one of the popular rapid methods (table 4). 18/ Industries marketing

Table 4.--Method of depreciation used in 1959 by various industries for all assets and assets purchased since 1954

Method of depreciation	All industries	Food and kindred products	Retail Food	Beverage manufacturing	Tobacco manufacturing	Textile mill products
	Percent	Percent	Percent	Percent	Percent	Percent
	All assets					
Straight-line	58	57	61	57	46	62
Declining-balance	21	23	24	21	21	25
Sum-of-years' digits	16	18	13	21	32	12
All other methods or not stated	5	2	2	1	1	1
Total	100	100	100	100	100	100
	Assets purchased since Jan. 1, 1954					
Straight-line	38	32	52	31	20	39
Declining-balance	34	38	30	33	31	35
Sum-of-years' digits	26	29	16	35	48	25
All other methods or not stated	2	1	2	1	1	1
Total	100	100	100	100	100	100

Source: Compiled from statistics of the Internal Revenue Service.

18/ Nonincorporated firms have not adopted rapid methods of depreciation as rapidly as have corporations. The total of all types of food and kindred product firms (including beverages) charged off 58 percent of depreciation in 1959 using the straight-line method (26). This compares with 69 percent for retail food and 62 percent for the all-industry average. The declining-balance method is the most popular rapid method used by nonincorporated firms. Additional first year depreciation by these firms is substantial. Also miscellaneous methods of depreciation are much more important for nonincorporated firms than for corporations.

agricultural products claimed as large or larger share of total depreciation under rapid methods in 1959 as did the all-industry average. Tobacco manufacturers were well ahead of the others with 53 percent of total depreciation using rapid methods.

Choice of method of depreciation is associated with size of firm. Only about one-third of the depreciation claimed on assets purchased since January 1954 by firms with less than $1 million in assets in 1959 were done by either of the two common rapid methods. Firms with over $25 million claimed more than two-thirds of their depreciation using these methods.

Adoption of new methods increased each year at a fairly constant rate. 19/ If this rate continued, more than one-half of the total depreciation claimed in 1963 is the result of using rapid methods. It is closer to three-fourths of the total for tobacco manufacturing.

Nearly all firms using one of the fast methods also have some assets depreciating on the straight-line basis (table 5). Many of these assets were purchased prior to January 1954. Relatively few firms use rapid methods compared to other methods of depreciation. In 1957, proportionately more firms in agricultural industries were using rapid methods than in the all-industry total. Tobacco manufacturers and textile mills led the list; retail trade (including retail food) trailed the all-industry average.

Effects of Using Rapid Methods

Depreciation is increased substantially above straight-line while a firm or industry is in the process of switching to use of rapid methods. The increase and timing of it will vary depending on the service life of the assets, the rate of purchasing assets, the methods of rapid depreciation followed, and the proportion of assets depreciated

Table 5.--Number of returns and depreciation claimed, by method of depreciation, 1957

Industry	Number of returns a/		Amount of depreciation		Total
	Straight-line	All other methods	Straight-line	All other methods	
	Percent	Percent	Percent	Percent	Percent
All-industry average	97	21	70	30	100
Food and kindred products	98	30	73	27	100
Beverage manufacturing	96	30	72	28	100
Tobacco manufacturing	100	43	59	41	100
Textile-mill products	98	37	75	25	100
Retail trade	98	16	78	22	100

a/ Do not add to 100 percent because some firms use more than one method.

Source: Statistics of Income (22, 1957-58, table 23, p. 115).

19/ Declining-balance and sum-of-the-years' digits methods accounted for 7 percent of total depreciation claimed in 1954, 16 percent in 1955, 21 percent in 1956, 27 percent in 1957, 34 percent in 1958, and 38 percent in 1959 (22, 1957-58 and 1959-60).

using rapid methods. The peak of the increase will come about midway through the weighted-average length of the service life of the assets (table 6). The peak is delayed beyond the middle of the average service life when purchases are rising over time (table 7).

Use of rapid methods of depreciation accounted for an estimated one-sixth of total depreciation in 1959. (See appendix for derivation) Only the estimate for tobacco manufacturing, about one-fifth of total depreciation, departed much from the average of all industrial corporations. Use of rapid methods of depreciation accounted for virtually all of the rise in rate of write-off per dollar of gross depreciable assets between 1953 and 1959. Comparable straight-line depreciation computed for 1959 yielded a rate of write-off that was within 0.3 percentage point of the rate for 1953 in each of the industries studied.

Rapid methods accounted for about one-third of the total rise in depreciation per dollar of depreciable assets that occurred between 1946 and 1959 for tobacco manufacturing, textile mills, and the all-industry average. They were responsible for about two-fifths of the total rise in food and kindred products and retail food, and over one-half of the total in beverages.

The effects of rapid methods of depreciation authorized in the 1954 Internal Revenue Code in 1963 are at or very near their maximum, making up roughly one-fifth of total depreciation. From this point of conversion to rapid methods, differences in length of service life and rates of new purchases begin to spread the range of the effects of rapid methods. In the future the effects are likely to recede. But, since new purchases are expected to continue rising the decline is not expected to reach zero. From that point on, a very gradual second ascent probably will begin. (See appendix.)

Service Lives of Depreciable Assets

Declining service lives -- The number of years over which an asset is depreciated for tax purposes normally must correspond to its estimated useful service life. The growing importance of obsolescence and shift in composite depreciable assets owned have resulted in lowering the average service life. This decline has been recognized by the Internal Revenue Service, primarily administratively, with the result that write-offs have been stepped up substantially by this method.

An average service life can be shortened by weighting purchases in favor of short-lived assets in place of those with longer lives. Rapid obsolescence discourages investment in a durable asset that will physically outlast its economic life. Growth of automation and adoption of technological improvements many increase investment in machinery and equipment relative to the investment in buildings. Renting buildings and continuing to purchase machinery and equipment may further reduce the average life of depreciable assets. A tendency may have existed to estimate service lives less than actual in order to offset the adverse effects of inflation and undervaluation or, before the days of rapid depreciation, to compensate for slow methods of write-off.

Until 1934, individual firms were free to charge off depreciation as fast as they desired. But at that time, Treasury Decision 4422 was issued shifting to the taxpayer the burden of justifying the depreciation taken. Depreciation charges were tightened in an effort to increase revenues. A policy change was made in May 1953, when it was announced that consistency would be a measure of evaluation of depreciation claimed.

Sixty-month service lives were temporarily recognized for certain facilities critical to the national defense by the Revenue Acts of 1940 and 1950. Amortization

Table 6--Change in depreciation for firm in process of transferring from straight-line to sum-of-years' digits method (SOYD), constant rate of new purchases

Item		Depreciation charge in year 1/							Percentage of annual depreciation under SOYD method
		0	1	2	3	4	5	6	
Year acquired	Cost of assets								
	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Percent
-4	1,500	300	Retired						0
-3	1,500	300	300	Retired					0
-2	1,500	300	300	300	Retired				0
-1	1,500	300	300	300	300	Retired			0
0	1,500	300	300	300	300	300	Retired		0
1	1,500		500	400	300	200	100	Retired	29
2	1,500			500	400	300	200	100	50
3	1,500				500	400	300	200	67
4	1,500					500	400	300	82
5	1,500							400	100
6	1,500							500	
Total annual depreciation		1,500	1,700	1,800	1,800	1,700	1,500	1,500	
Comparable straight-line		1,500	1,500	1,500	1,500	1,500	1,500	1,500	
Depreciation due to rapid method		0	200	300	300	200	0	0	
Percent of annual depreciation		0	12	17	17	12	0	0	
Decline in tax, at 50-percent rate		0	100	150	150	100	0	0	
Decline in after tax profit		0	100	150	150	100	0	0	
Deferred taxes account		0	100	250	400	500	500	500	

1/ All assets have a 5-year service life and zero salvage value. Assume firm used straight-line method of depreciation through year zero and SOYD on new purchases thereafter.

Source: Based on Davidson (4).

Table 7.--Change in depreciation for firm in process of transferring from straight-line to SOYD, new purchases rising 5 percent annually

Item		Depreciation charge in year 1/								Percentage of annual depreciation under SOYD method
		0	1	2	3	4	5	6	7	
Year acquired	Cost of assets									
	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Percent
-4	1,500	300	Retired							0
-3	1,575	315	315	Retired						0
-2	1,654	331	331	331	Retired					0
-1	1,736	347	347	347	347	Retired				0
0	1,823	365	365	365	365	365	Retired			0
1	1,914		638	510	383	255	128	Retired		32
2	2,010			670	536	402	268	134	Retired	53
3	2,110				703	563	422	281	141	69
4	2,216					739	591	443	295	84
5	2,327						776	621	465	100
6	2,443							814	651	100
7	2,565								855	100
Total annual depreciation		1,658	1,996	2,223	2,334	2,324	2,185	2,293	2,407	
Comparable straight-line		1,658	1,740	1,827	1,919	2,015	2,115	2,221	2,332	
Depreciation due to rapid method		0	256	396	415	309	70	72	75	
Percent of total depreciation		0	13	18	18	18	3	3	3	
Decline in income tax, at 50-percent rate		0	128	198	212	154	35	36	37	
Decline in after tax profit		0	128	198	212	154	35	36	37	
Deferred taxes account		0	128	326	538	692	727	763	800	

1/ All assets have a 5-year service life and zero salvage value. Assume firm used straight-line method of depreciation through year zero and SOYD method on new purchases thereafter.

Source: Based on Davidson, S. (4).

was limited to use of the straight-line method. Use of this authority was restricted in 1957, and certification of new facilities expired December 31, 1959. Grain-storage facilities completed between 1953 and 1956, inclusively, also were authorized to be amortized over a 60-month period.

A guide to length of service lives for about 5,000 items was published by the Bureau of Internal Revenue in 1942. Bulletin "F," as the guide was called, continued unrevised until 1962. Since it was intended only as a guide, firms have been free to negotiate with IRS in establishing lives of assets that coincide with experience. This flexibility has resulted in a reduction in average lives in spite of the policy of consistency which tended to ignore obsolescence and perpetrate historical estimates of useful lives.

Bulletin "F" recommendations had about a 19-year average. A Treasury Department survey in 1959 reported an average life of 15.2 years for all production machinery and equipment in current use (25, table 2). Agricultural industries compared as follows:

Industry	Bulletin "F" composite (years)	1959 actual practice (years)
Food and kindred products:		
Dairy products	14-20	13
Grain-mill products	18-20	19
Meat products	17-20	15
Sugar and sugar products	28-30	
Vegetable-oil products	25	17
Other food products	12½-40	
Beverages (other than kegs, cases, and bottles)	13-20	13
Textile-mill products	15-25	17
Tobacco	15-20	17

The estimated average useful life of all types of depreciable assets owned by all industrial corporations was 26 years in 1959 (table 8). 20/ The industries processing agricultural products had overall averages between 23 and 26 years, but the average for retail food was only 13 years. These averages are intermediate between the lives of structures and equipment. The same disparity among industries existed in lives of structures (including real estate leasehold improvements) and equipment (including all other depreciable assets) taken separately. However, equipment in all industries weights the average more heavily than does structures because it accounts for two-thirds to four-fifths of total depreciation charges (table 8).

20/ This average is weighted by cost according to the following formula:

$\frac{\sum_i (C_i L_i)}{\sum_i C_i}$, where C_i is the original cost of cash asset (or group of assets) and L_i is the average life of each. An alternative system of weights,

$\frac{\sum_i C_i}{\sum_i (C_i / L_i)}$, is used in computing the new guideline lives. It gives an average life of 19 years for depreciable assets in all industries, 16 years in food and kindred products, 11 years in retail food, 17 years in beverage and tobacco manufacturing, and 19 years in textile-mill products.

Table 8.--Average useful lives of depreciable assets owned by corporations, 1959 1/

Industry	All types of assets	Structures 2/	Equipment 3/
Total Depreciable Assets	Years	Years	Years
All-industry average	26	32	19
Food and kindred products	23	36	15
Beverage manufacturing	26	36	16
Tobacco manufacturing	24	34	17
Textile-mill products	24	34	17
Retail food	13	20	11
Assets Purchased Since Jan. 1, 1954			
All-industry average	22	29	15
Food and kindred products	19	34	13
Beverage manufacturing	23	33	14
Tobacco manufacturing	18	26	15
Textile-mill products	18	26	15
Retail food	12	17	10
Assets Purchased Before Jan. 1, 1954 That Were Still being Depreciated In 1959			
All-industry average	29	34	22
Food and kindred products	27	37	16
Beverage manufacturing	29	38	17
Tobacco manufacturing	29	38	19
Textile-mill products	29	38	19
Retail food	17	24	12

1/ Average useful lives are weighted by cost, $\Sigma_i (C_i L_i) \Sigma_i C_i$. These averages are not comparable with class lives using the new guidelines because of a different weighting system. See footnote 20/.

2/ Includes real estate leasehold improvements.

3/ Includes furniture, fixtures, equipment, machinery, and other depreciable assets.

Source: Complied from statistics of the Internal Revenue Service, Life of Depreciable Assets Study.

Depreciable assets purchased since January 1954 in all industries have a shorter average life than do the assets purchased before 1954 that were still being depreciated in 1959 (table 9). 21/ Decreases on one-fifth to two-fifths took place in average lives. The reduction in average lives is greater, percentage-wise, for equipment than it is for structures in the all-industry average, food and kindred products, and beverages.

Effects on rate of asset write-off. -- Reductions in service lives were estimated to be responsible for all of the rise in rate of write-off between 1946 and 1954 but virtually none of the rise since then. Data for 1950 show a halt in the postwar rise in rate of asset write-off in many industries. The renewed rise can be traced partly to the 60-month service lives authorized in the 1950 Revenue Act. The decline in importance of these arbitrarily short-lived assets after 1957 apparently offset the general trend toward shorter lives. The net result was no upward push in the rate of asset write-off by declining lives between 1954 and 1959 (12, pp 17-18).

Reduced service lives were responsible for nearly one-half of the total rise in depreciation per dollar of depreciable assets that occurred between 1946 and 1959 in beverage manufacturing, over one-half of the rise in retail food and kindred products, and nearly two-thirds of the rise in textile mills, tobacco manufacturing, and the all-industry average. Changes in rapid methods have been more dramatic because they are more tangible but, except for the beverage industry, the effects of changes in service lives have been more important in increasing costs of depreciation.

These substantial proportions of the total rise were not measurable directly because of their adoption by administrative means and result of changes in asset mix. Measuring the effect of reductions in service lives on raising the annual rate of asset write-off is confounded by changes that have taken place in methods of allocating total depreciation over the service lives of individual assets. Since the two together comprise the total change in rate of write-off, the impact of reduced service lives was estimated by subtraction.

Reduced average lives were estimated to be the most important of the three forces behind the 1946-59 annual average rate of increase in depreciation per dollar of total receipts (table 2). 22/ This generalization holds true for each of the industries compared except beverages which had a large increase in depreciable assets per dollar of total receipts. Reduced lives of assets was more influential in the all-industry average than in any of the agricultural industries.

DEPRECIATION CONTRASTED WITH NET INCOME

The rapid rise that took place in depreciation in postwar years contrasted with that of net income in many industries. It showed up most strikingly for the all-industry average. Depreciation exceeded after-tax profits in 1958 and 1959, which represented a sizable shift from a decade earlier. These trends raise the question of the association between depreciation and net income.

21/ Short-lived assets purchased before 1954 may have been replaced or fully depreciated before 1959, whereas more of the comparable assets would be included in the assets purchased since 1954.

22/ Partitioning the increase in rate of write-off between method of write-off and changes in asset lives is relatively unaffected by inflation. But, in allocating their effects back to depreciation per dollar of total receipts, as done in table 2, and inflation bias may result. Price-level changes may affect the stock of depreciable property differently from total receipts.

Table 9.--Distribution of cost of depreciable assets and depreciation charges among structures and equipment of corporations, 1959

Industry	Cost of depreciable assets			Depreciation charged		
	Structures 1/	Equipment 2/	Total	Structures 1/	Equipment 2/	Total
	Percent	Percent	Percent	Percent	Percent	Percent
Total Depreciable Assets						
All-industry average	50	50	100	36	64	100
Food and kindred products	38	62	100	22	78	100
Beverage manufacturing	51	49	100	34	66	100
Tobacco manufacturing	40	60	100	24	76	100
Textile-mill products	31	69	100	20	80	100
Retail food	28	72	100	21	79	100
Assets Purchased Since Jan. 1954						
All-industry average	46	54	100	31	69	100
Food and kindred products	28	72	100	15	85	100
Beverage manufacturing	44	56	100	29	71	100
Tobacco manufacturing	27	73	100	19	81	100
Textile-mill products	26	74	100	19	81	100
Retail food	24	76	100	19	81	100
Assets Purchased Before Jan. 1954 That Were Still Being Depreciated in 1959						
All-industry average	54	46	100	43	57	100
Food and kindred products	47	53	100	33	67	100
Beverage manufacturing	56	44	100	41	59	100
Tobacco manufacturing	51	49	100	35	65	100
Textile-mill products	33	67	100	21	79	100
Retail food	39	61	100	30	70	100

1/ Includes real estate leasehold improvements.
2/ Includes furniture, fixtures, equipment, machinery, and other depreciable assets.

Source: Compiled from statistics of the Internal Revenue Service, Life of Depreciable Assets Study.

Depreciation, like any other cost, is subtracted from total revenue in computing profits. But unlike most other costs, depreciation charges are not cash costs. Capital consumption is difficult to properly allocate over time, even conceptually. In practice, the proration of depreciation has changed considerably, particularly in the last decade. Depreciation rose precisely during the time that net incomes fell. No doubt the rise in depreciation contributed to the decline in profits; but, only to the extent that the rise in depreciation was unwarranted can depreciation be considered a substitute for profits. (See appendix for implications of rapid methods.) Nevertheless, during the switchover to using rapid methods, depreciation is higher for a firm or industry than it will be after the conversion is made and all new assets are depreciated by the same rapid method. Also, it might be argued that recent depreciation rates are the appropriate ones and that during earlier years, capital consumption was understated, in which case profits were understated in those years. Partly for these reasons, it may be more meaningful to look at the total of depreciation and net income during the postwar years than to look at the two separately.

Profits after taxes and depreciation together represent the bulk of money retained by the corporation before distributing dividends. 23/ These two items together, often called total cash flow, represent the sum of money available to a firm after cash costs are paid, but before the bulk of capital requirements are satisfied and equity disbursements made. For purposes of cost analysis, plans for internal expansion, and possibly stockholder evaluation of a firm, the amount of total cash flow may be more relevant than either profits after taxes or depreciation alone. Use of cash flow overcomes the necessity of reconciling or choosing among different methods of depreciation used for tax and financial purposes.

Total capital costs, regardless of their distribution, are of interest to consumers and producers of farm products because of effects upon prices. Cost analyses may be more concerned with the total amount of funds retained by the firm than the distribution of these funds among internal uses. The bulk of expansion usually is financed with internal funds so cash flow (perhaps less dividends) is a pertinent decision variable in managements' plans for expansion.

Since owners of a firm have claim to the entire income of a corporation, total income after taxes may be of more importance to stockholders than the rate and timing of payout of dividends. A preference for liquidity results in valuing current depreciation charges above future profits so cash flow based on past capital expenditure may be more adequate determinant of value than profits. Rising depreciation has the advantage of adding directly to cash flow without raising taxes whereas rising profits increase taxes. Cash flow may represent more reliable data than either depreciation of profits in ascertaining the true financial status of a firm or industry, particularly during periods of rapid inflation or deflation, unusual changes in amount of depreciable assets, or when large changes are made in accounting procedures. For these reasons, owners and managers of firms and policymakers concerned with equitable income distribution or the evaluation of market performance often are interested in trends based on stockholders' equity.

Comparisons among depreciation, profits, and cash flow are made using ratios based on both total receipts and stockholders' equity. Each gives a different historical perspective. Evaluations of depreciation, like profits, differ considerably depending on the ratios compared.

23/ In addition, certain funds such as deferred taxes may be retained, but are not included in cash flow as herein defined.

Cash-flow analyses must recognize certain shortcomings that arise from the inclusion of capital consumption with net income. Comparisons within firms, industries, or groups of industries must be made with the realization that changes in capital consumption probably have occurred over time. Substitutions of capital for other inputs, changes in obsolescence rates, and changes in growth rates all would contribute to speeding up capital consumption. In such cases rising cash flow could mean stable profits. Also, comparisons of cash flow among firms or industries can be misleading. Substantial differences may exist in capital consumption by virtue of differing technological requirements. In short, cash flow is not a substitute for profits and cannot be interpreted as such; it has certain advantages over profits in evaluating firm or industry performance, but also it has some disadvantages.

Cash Flow Per Dollar of Total Receipts

Net incomes of food-marketing corporations rose sharply during World War II, declined in the early 1950's, but have stabilized or risen since then when computed as a percentage of total receipts (fig. 4). Because of the rising tax rates over the period, the postwar decline was sharper after than before deducting income taxes. In 1959, after-tax profits per dollar of total receipts were well below prewar levels for the food and kindred products and beverage industries but about the same for retail food. Textile mills experienced the same, though amplified, pattern of rise in profits per dollar of receipts in the 1940's followed by a postwar decline (fig. 5). Tobacco manufacturing followed a trend almost reverse that of the other agricultural industries (fig. 5). The profit ratio of the all-industry average remained high after

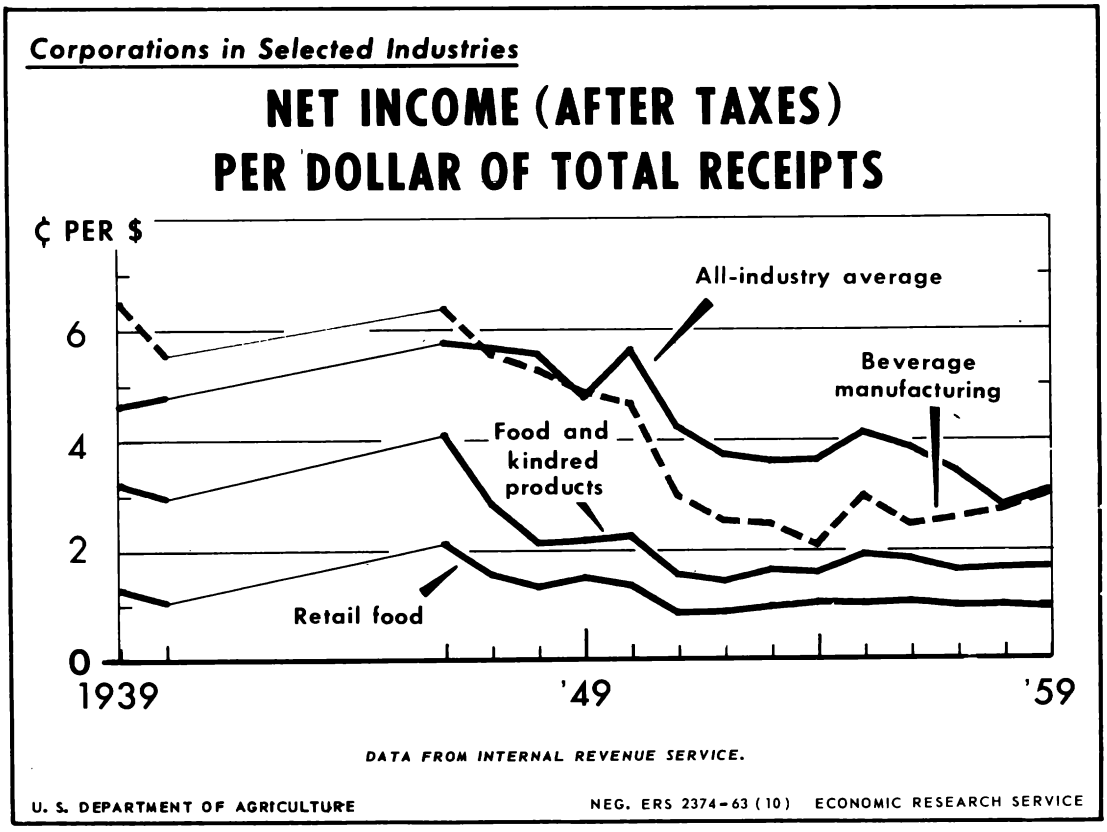

Figure 4

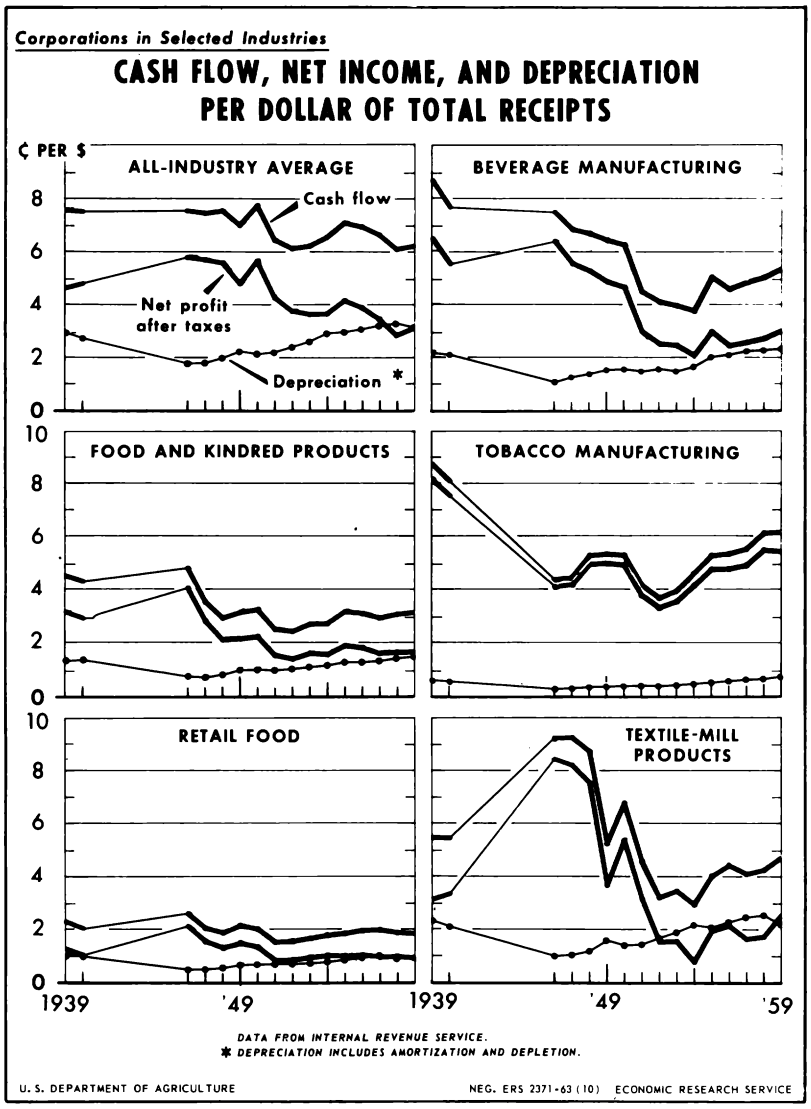

Figure 5

World War II for a longer period than did those of most of the agricultural industries, but it declined throughout the 1950's, after profits of the agricultural industries had turned up.

The general pattern of depreciation per dollar of total receipts was inversely associated with that of profits during most of the last two decades, except for tobacco manufacturing (fig. 5). The profit ratios of most industries that market farm products differed from that of the all-industry average by rising with depreciation since the early 1950's. However, per dollar of total receipts, depreciation overtook profits in 1952 in the textile-mill industry, in 1957 in retail food, and in 1958 for the all-industry average.

The opposing trends of the two components of cash flow combined to moderate fluctuations in cash flow for the food-marketing industries and the all-industry average from prewar through the early 1950's. The all-industry average had remarkably stable cash flow during this period but declined during the 1950's. Contrarily, upward trends in cash flow from low points in the early 1950's through 1959 characterized the agricultural industries. But, cash flow per dollar of total receipts of these

industries in 1959 remained below prewar levels, substantially below in most cases. As a result, changes in cash flow fail to explain any of the rising farm-retail marketing margins observed during the period. Rising depreciation charges since about 1946 were more than offset by declining profits.

With respect to internal sources of funds available for reinvestment or expansion, 1959 levels of cash flow were low when viewed in a prewar or immediate postwar perspective. But recent uptrends followed by the agricultural industries may portend expansion from levels attained in the early 1950's. The downward trend in the all-industry average was consistent with observed low levels of industry growth in recent years (3). Use of new guideline lives and the investment credit may moderate or reverse this downtrend.

Cash Flow Per Dollar Of Equity

Quite a different picture is presented when depreciation, profits, and cash flow are analyzed on the basis of stockholders' equity. Ratios of equity to total receipts declined substantially during the war but remained quite stable since 1946 in all industries except beverage manufacturing, so by 1959 ratios based on equity were higher than those based on total receipts. Substantial variations among industries in ratios of equity to total receipts resulted in shifts among their respective profit and depreciation ratios. In 1959, all of the agricultural industries except textile mills earned more on equity than did the all-industry average (fig. 6). This result was the culmination of a downward trend for the all-industry average compared with stabilized or higher profits for the agricultural industries during the late 1950's. Tobacco manufacturing and retail food corporations showed the most advance in recent years. A spread among industries of less than 3 percent in net profits after tax in 1950 increased to more than 9 percent in 1958. A comparison of 1959 with 1939 shows that the after-tax profits of retail food industries were well ahead and beverages were well below their prewar levels. The other industries and the all-industry average were fairly close to earlier levels. These trends contrast sharply with the downward historical trends based on total receipts.

Depreciation per dollar of equity of the agricultural industries declined much less during the war period than did depreciation per dollar of cash receipts (fig 6). However, even the small declines contrasted with the all-industry average that was up slightly during these years. The rise since 1946 was rapid in all industries compared, so that by 1959 depreciation per dollar of equity was well above prewar levels. This trend contrasts sharply with that based on total receipts, which returned approximately to prewar levels by 1959.

Retail food corporations remained well above all other industries in depreciation per dollar of equity throughout the two decades. This position is due partly to the lowest ratio of equity to total receipts. A relatively low rate of depreciation to total receipts resulted in high depreciation to equity. Tobacco manufacturing remained well below the all-industry average. Food and kindred products, beverage manufacturing and textile-mill products were all close to the average,but none of the three increased as much over the 1939-59 period as did the all-industry average.

Strong upward trends in profits on equity during the war combined with depreciation to bring about strong upward trends in cash flow in all industries except tobacco manufacturing (fig. 6). Profits of the agricultural industries depressed cash flow into the early 1950's, but for most industries cash flow rebounded rather sharply -- in recent years -- combining rising depreciation with stable or rising profits. For the

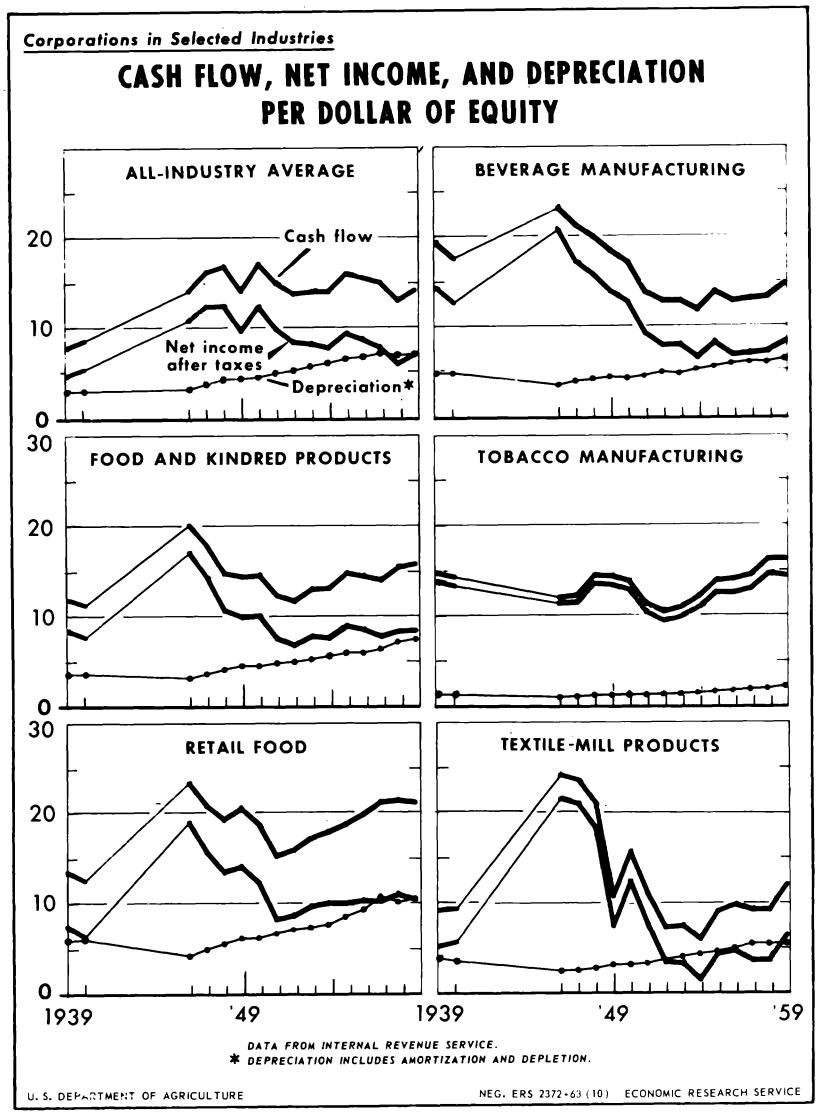

Figure 6

all-industry average, cash flow in 1959 remained near its high postwar plateau, thanks to rising depreciation offsetting declining profits. A recent downtrend appeared to contrast with those of the agricultural industries. However, the postwar decline based on equity was small compared with that based on total receipts.

Retail food stands out as the industry with the most advance in cash flow per dollar of equity in comparing 1959 with 1939. From a midrange among industries in 1939, retail food rose to a commanding lead in 1959. Cash flow of the retailers jumped from about 12 cents per dollar of equity prewar to nearly 20 cents in 1959. Food and kindred products and the all-industry average also showed substantial increases. Tobacco manufacturing and textile mill products were slightly above 1939 in 1959. But, beverage manufacturing -- highest among industries in 1939 -- was down sharply by 1959; they declined from about 17 cents to 13 cents.

The trends that have taken place in the last two decades focus attention on the different conclusions to be drawn from the use of total receipts and stockholders' equity as a basis for comparison. For retail food and food and kindred products, stability or decline in cash flow per dollar of total receipts was found to be consistent with rising cash flow per dollar of equity. Contrasts in other industries are as great,

but not all show a change in direction of trends. Equity comparisons help in understanding the basis for the market for common stocks that developed throughout the 1950's. Profits alone do not show the vitality expressed by cash flow.

Recent upward trends in cash flow owe a good measure of their strength to rising depreciation charges. The fact that depreciation overtook profits in retail food, textile-mill products, and the all-industry average dramatized the changing role of the two components of cash flow. Depreciation grew in importance when viewed from the standpoint of total receipts, but it was emphasized even more in terms of equity.

Industries that market agricultural products for the most part followed trends of the all-industry average. Differentials from it in terms of total receipts primarily reflected differences in turnover of merchandise, value added, and variations in use of fixed assets. Stockholders' equity as a base allowed industries to be compared on a more uniform basis than did total receipts. It showed agricultural industries to be rather typical of the economy but spotlighted certain abnormal periods such as the late 1940's and 1955-58 when agricultural industries appeared to be relatively more profitable.

DEPRECIATION AND INVESTMENT

Depreciation, as a reflection of past purchases, constitutes an important source of funds accruing to a firm. This flow of funds rivals profits in magnitude, and together they provide a substantial basis for new purchases of property. Changes that have taken place in reserves for depreciation are studied for clues in assessing the adequacy of depreciation in providing for asset replacement. Additions to gross depreciable assets, as an approximation of purchases, are compared with depreciation and total cash flow.

Reserves for Depreciation

Reserves for depreciation increased as a proportion of total investment in depreciable assets in comparing 1949 with 1959 (table 10). The rise was greater for each of the agricultural industries than for the all-industry average. Reserves in food and kindred products, beverage manufacturing, and tobacco manufacturing in 1959 exceeded the high levels that prevailed in 1946 -- a year climaxing the war period during which depreciation continued but few new purchases were made.

The rise in proportion of reserves since 1949 suggests a fall-off in new purchases relative to current depreciation, in spite of inflation during the period valuing new investments in "cheaper" dollars than those charged off by depreciation. Gross depreciable assets rose rapidly during the 1950's but rates of depreciation apparently rose relatively more rapidly.

The variables affecting reserve ratios include the rate of change in depreciable assets, methods of depreciation used, and service lives of assets. These relations were quantified in a series of tables used in connection with the new guideline service lives (24, pp. 36-40). A 4-percent annual rate of increase in depreciable assets with an average life of 10 years results in a stabilized reserve ratio of 47 percent using the straight-line method, 57 percent using double-declining balance, and 62 percent using sum-of-the-years' digits. A 20-year life with the same rate of growth yielded

Table 10.--Reserves for depreciation, selected years, 1939-59 1/

Year	All-industry average	Food and kindred products	Beverage manufacturing	Retail food	Textile-mill products	Tobacco manufacturing
	Percent	Percent	Percent	Percent	Percent	Percent
1939	30	42	34	46	50	50
1946	39	46	40	46	54	41
1949	35	41	32	37	43	36
1954	35	44	37	41	43	46
1959	37	47	44	41	49	44

1/ Accumulated depreciation as a proportion of gross depreciable assets. Depreciation includes accumulated amortization and depletion; assets include depletable and intangible assets.

Source: Complied from tables 13-18.

reserve ratios of 44, 53, and 59 percent for the respective methods of depreciation. Lowering the annual rate of increase in assets increased the reserve ratio.

Thus, the observed rises in reserve ratios were consistent with observed changes in methods of depreciation and service lives of assets. As reported, firms have been switching from using straight-line to rapid methods of depreciation. Average lives of assets have been getting shorter, but little change was noted in the rate of change in depreciable assets. As a result, a historical comparison of gross reserves is not an appropriate measure of the adequacy of depreciation in providing funds for replacement. Reserve ratio tables such as those of IRS are useful if classification of the data are available. But they are applicable only after long-term adjustments have been made. In addition, changes in rates of growth, new categories of assets and aggregation among classes of assets still confound interpretation of reserve ratios.

Fund for Reinvestment

A disparity between depreciation charged and the current value of physical consumption of fixed capital often is deplored as the reason for the difference between depreciation and replacement costs. But, this association is not causal. Even if capital consumption corresponded with depreciation, it probably would continue to differ from replacement costs. Expansion or contraction of a firm over time, replacement with improved equipment, and price-level changes all would contribute to such a result.

The concept of depreciation as accruing at all is erroneous. No fund or reserve is being built up by depreciation except for accounting purposes. Economically, depreciation is an imputation or costing-out of funds previously spent. Prospective new purchases must be evaluated on their own merits. Decisions regarding replacement, growth, or contraction are made on the basis of future expectations. Depreciation is one source of funds usable for new purchases, but profits, equity flotations, and

borrowed funds of various sorts constitute other sources of funds in many ways equally appropriate for financing new purchases.

Revaluing fixed-capital assets annually on the basis of changes in the price level and depreciating this amount often is cited as the best cure for the price-level problem. But, this adjustment would alleviate only a part of the disparity between depreciation of a given asset and its replacement cost. During continuing inflation, capital revaluation based on price-level changes during the early part of a durable asset's life would be less than that during the later part. Total depreciation charges over time based on the revaluations would not equal replacement costs, since replacement would be made at the time of the final revaluation; so only the final year's depreciation would be in terms of dollars with the same purchasing power as of the "replaced" asset. However, continued reinvestment of depreciation would result in no price level losses.

Without price-level adjustment, inflation places financing burden on firms with heavy capital investments to replace (13, pp. 177-79). Depreciation measured in dollars of an earlier time period (original cost) is less than the dollars of capital consumption appropriate to the current production period. Such an understatement of capital consumption results in an understatement of total cost and an overstatement of gross income, income taxes, and net income during times of inflation. Both the overpayment of taxes and proportional distribution of net income to owners of a firm results in less money internally available to a corporation for new purchases. It may be necessary to use a growing share of profits or outside financing merely to maintain capital on a real dollar basis during periods of prolonged inflation.

Over half of the corporations responding to a recent Treasury Department survey indicated interest in some form of depreciation price-level adjustment (23, p. 5). However, to allow such an adjustment for tax purposes would raise questions of equity with individuals or other sectors of the economy equally or more adversely affected by inflation in other ways.

Depreciation as a Source of Funds

Even though the economic relationship is tenuous, there are financial reasons for an association of depreciation and new purchases. Depreciation was shown to represent a substantial and increasing proportion of the total flow of funds internally available to a going concern. When cash dividends are subtracted from profits, the change in composition of cash flow is even greater. When external sources of funds are added to internal sources, depreciation continues to rate as a major item.

A striking similarity exists over time between gross additions to depreciable property (or new purchases) and total cash flow less cash dividends (fig. 7). 24/

24/ Gross additions were estimated from Internal Revenue Service data for corporations because of comparability with depreciation. The year-to-year increase in gross depreciable assets was added to the decline in reserves between the end of the previous year and the end of the current year. Reserves for the beginning of the current year were obtained by subtracting current year depreciation from reserves reported for end of the current year. Depletable and amortizable assets and reserves have been included with those of depreciation. Gross additions are numerically approximated by purchases of new machinery and equipment reported jointly by the Office of Business Economics and the Securities and Exchange Commission. Gross additions differ from purchases by the addition of assets through the net accretion of corporations or assets required by merger or consolidation over time and, primarily in 1958, by changes in industry classification of firms. OBE-SEC purchase data include non-corporations and differ somewhat in industry definition from that used by IRS.

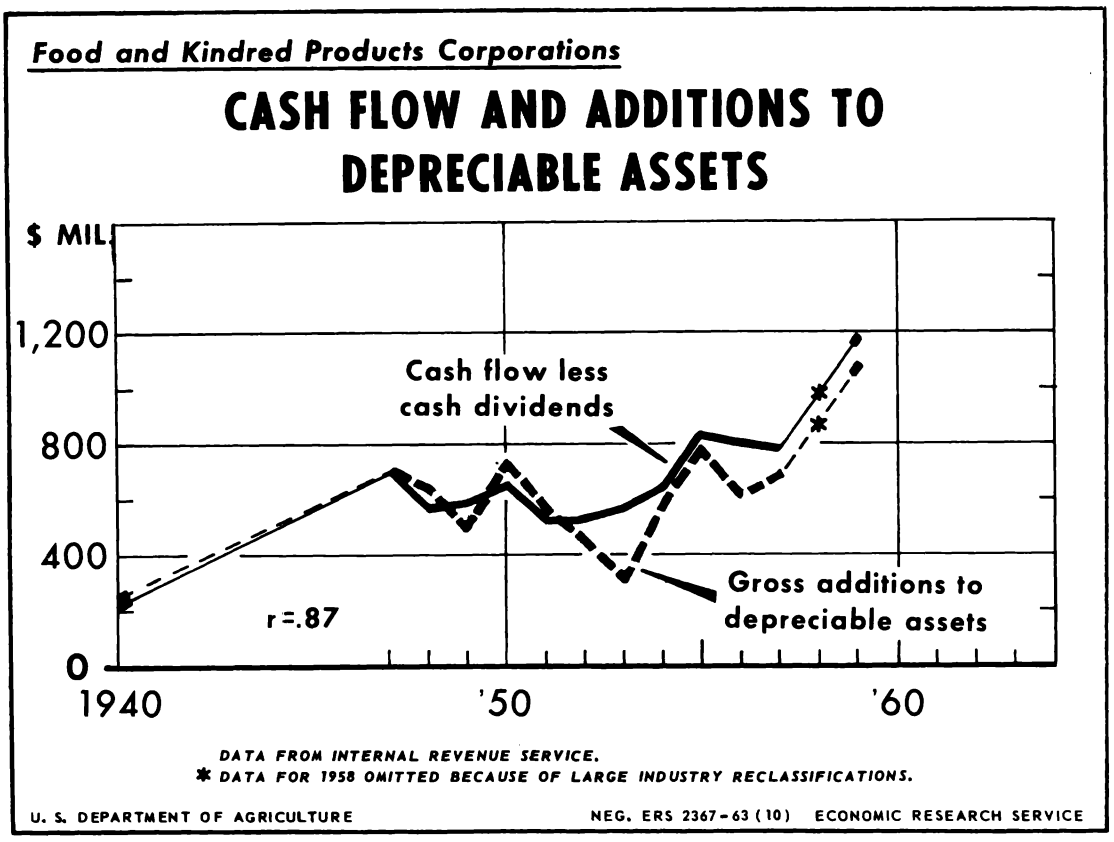

Figure 7

The all-industry group had the highest statistical correlation between gross additions and cash flow less dividends (r = .97). Food and kindred products, retail food, and beverage manufacturing also had high correlations (r's of .89, .85, and .77). Textile-mill products and tobacco manufacturing showed lower degrees of association (r's= .69 and .36). The correspondence of gross additions and cash flow less dividends in most of these industries was surprisingly close considering that inventory and other working capital requirements also have increased during the postwar period. Perhaps financing of working capital explains why gross additions exceeded cash flow less dividends during the first half of the period but positions reversed after 1952 (fig. 7).

Depreciation alone does not exhibit the close association to gross additions as does total cash flow less dividends. Rather, as the major component of cash flow, depreciation provides underlying support as a source of funds for gross additions. This observation is clarified by separating gross additions to depreciable property and cash flow less dividends each into two related parts. Depreciation is related to replacement of property leaving net additions to depreciable assets to be compared with retained earnings.

Depreciation and net replacements in food and kindred products both followed a fairly stable upward trend in the past two decades (r=.85) (fig. 8). Annual changes in depreciable property have been closely related to retained earnings (r =.75). In contrast

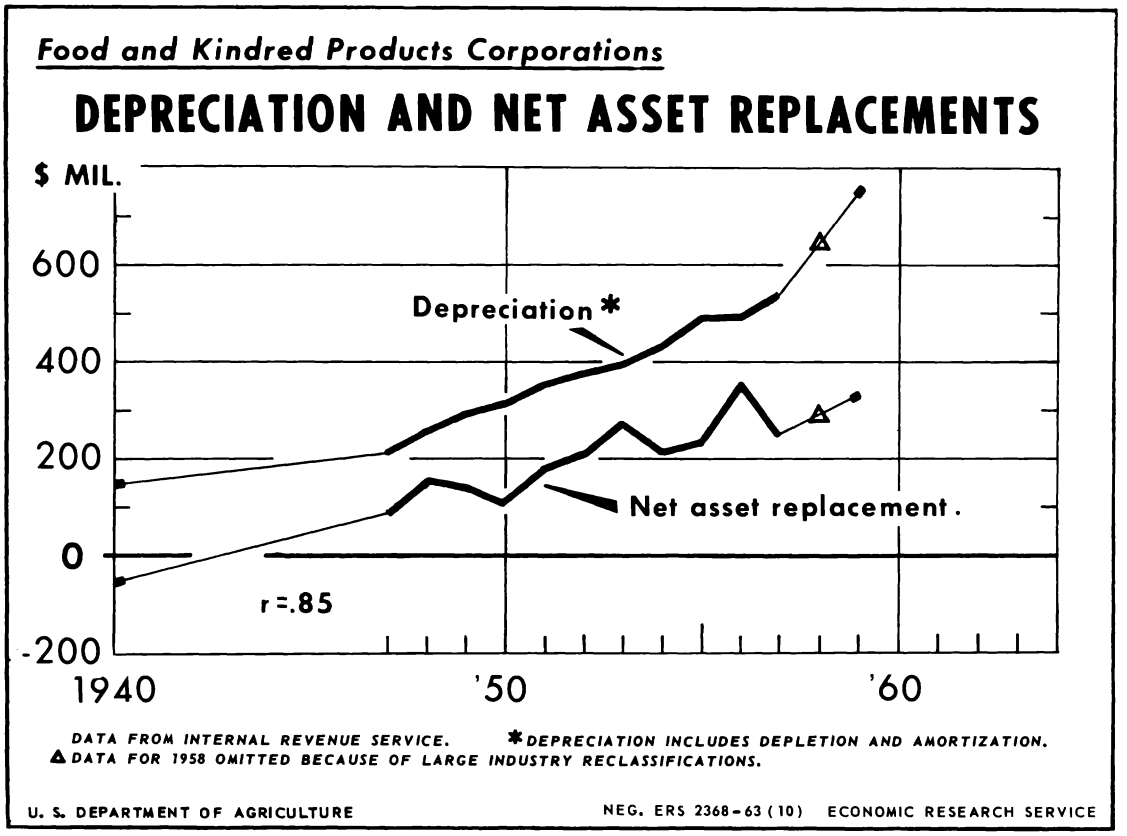

Figure 8

with depreciation, both exhibited wide cyclical fluctuations (fig. 9). 25/ These associations are consistent with expectations. They lend support to the contention that increases in new purchases above "normal" replacements are keyed to profitability rather than changes in depreciation. 26/

Tool of Fiscal Policy

Depreciation charges can be used as an instrument of fiscal policy in stimulating purchases of plant and equipment. Quick write-off of original cost reduces the interest cost of an investment. By improving expectations, such reduction in costs is expected to stimulate purchases when the policy is known in advance. Many countries allow use of rapid methods of depreciation or recognize abnormally short lives of assets for tax

25/ The difference in levels between replacements and depreciation and between gross depreciable assets and retained earnings must be discounted because of the method of computation. New corporations' reserves reduce computed replacements, but their gross depreciable assets are included in the total increase in gross depreciable assets.

26/ The association between retained earnings and changes in depreciable assets is not expected to be a casual relationship. Net earnings may be a "proxy variable," as explained by Eisner (8, p. 36). Rising earnings result from favorable demand and cost relationships that also give rise to rosy expectations of prospective capital purchases. As a source of funds, retained earnings has slipped well below depreciation, thus amplifying its role as an indicator of future expectations.

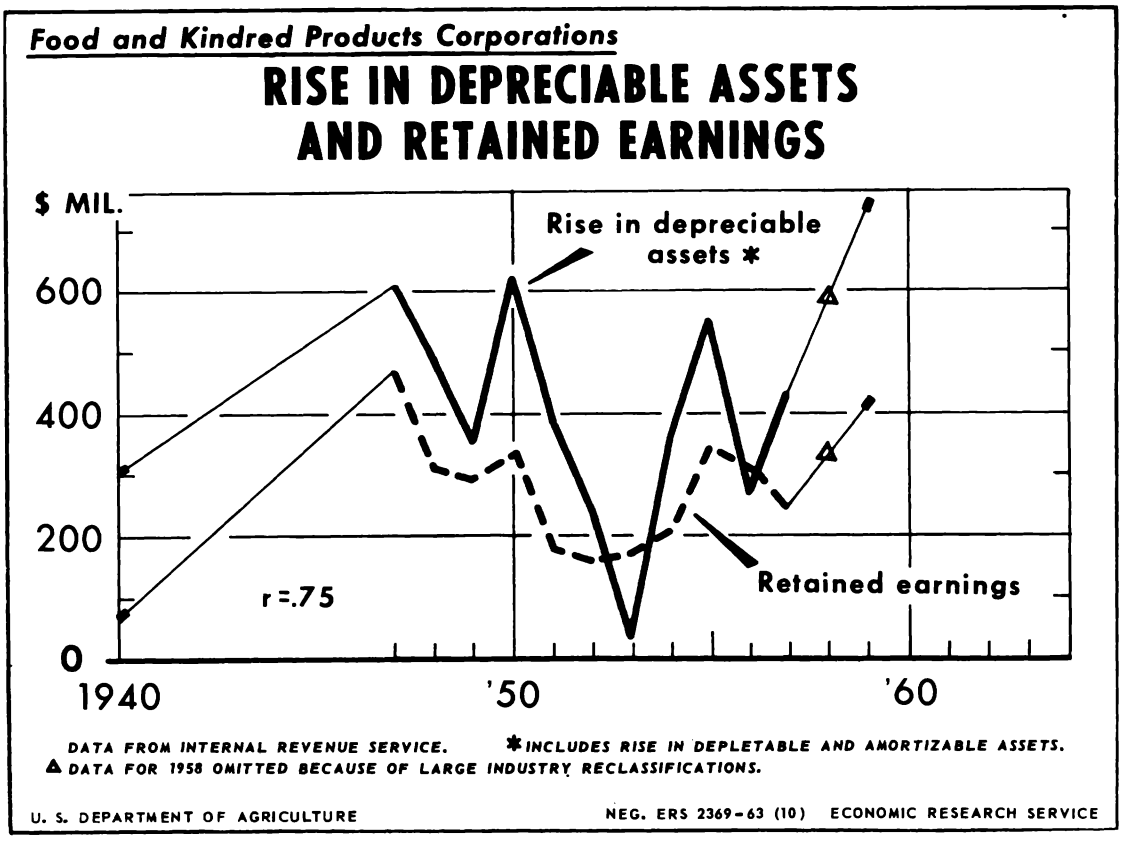

Figure 9

purposes with the objective of speeding economic development (18). For example, Germany allows a 75-percent asset write-off in 3 years of new purchases made in Berlin. Some countries use fluctuating rates of depreciation as countercyclical devices. One country, France, keys a firm's depreciation to its proportion of sales exported.

Inflation itself may cause straight-line depreciation to be countercyclical. Understatement of capital consumption during inflation tends to increase taxes, thereby reducing total cash flow and perhaps adversely affecting expectations at a time when demand exceeds supply of goods available. Conversely, during deflation overstatement of depreciation tends to increase total cash flow.

The United States has not often used depreciation expressly as a fiscal tool. An exception was the additional first year depreciation authorized in 1958 to aid small businesses. Tax credits authorized by the Congress in 1962 were designed to stimulate purchases of new plant and equipment. Most of the revisions made in the revenue codes since 1934, notably those made in 1954, had the purpose of increasing allowable depreciation to conform to actual loss of value through obsolescence and shorter service lives. Changes in administration of the tax codes, such as the authorization of new guideline service lives in 1962, had a similar objective. Regardless of objectives, the results of these various programs were to increase considerably both cash flow and new purchases in postwar years.

NEW DEVELOPMENTS IN DEPRECIATION

New Guideline Service Lives

In July 1962, a new policy regarding useful lives of depreciable property was initiated by Internal Revenue Service. Guideline service lives were announced for about 75 broad classes of assets (24). These classes followed industry classifications for most machinery and equipment. Special purpose structures were included with the equipment they house. Separate classes were established for various kinds of buildings, different types of transportation equipment, land improvements, and office furniture, fixtures, machines, and equipment. Firms now have the option of depreciating assets individually, as typically done in the past, or of depreciating assets in these various classes.

Recommended guideline service lives on production machinery and equipment average 15 percent shorter than the average found in practice in 1959 for all manufacturing in the Treasury Department's survey of corporations (25, table II). Comparisons for the agricultural industries are as follows:

Industry	1959 actual practice	New guidelines	Percentage decrease to new guidelines
Food and kindred products:	Years	Years	Percent
Dairy products	13	12	8
Grain-mill products	19	17	11
Meat products	15	12	20
Sugar and sugar products	17	18	n.a.
Vegetable-oil products		18	n.a.
Other food products		12	54
Beverage manufacting	13	12	8
Textile-mill products	17	9-15	18
Tobacco manufacturing	17	15	12
Retail food	n.a.	10	n.a.

n.a. = not available.

An average of 13 years recommended for all manufacturing is expected to be reduced to about 12 years in practice because average lives currently in use that are below recommended guidelines will be allowed to remain unchanged. This means an effective reduction of about 21 percent (rather than the 15 percent) is expected in comparing new practices with the practice used in 1959 (24, p. 3).

Additional reduction in service lives is expected as a result of the procedure recommended for computing class lives. Salvage value of depreciable assets and part year depreciation both contribute to reducing acceptable service lives of indi-

vidual assets. 27/ However, all businesses will not choose to follow the recommended guidelines. Some will feel that current service lives are adequate and reflect replacement policies. Others will not reduce service lives because of its consequent lowering of profits. Some of the potential increases in depreciation will not be reflected by those firms earning no profits, but tax liability of future years may be affected by loss carry-forward provisions.

Reduced lives of depreciable property are expected by the Treasury to increase total depreciation deductions of all corporations in the economy by 14 percent (17 percent for property other than buildings) in the first full year going into effect (table 11). The expected increase for the agricultural industries varies from 7 to 14 percent. These rates far exceed the annual average increase in the rates of depreciation for the 1946-59 period (table 3).

Table 11.--Effects of new guideline service lives on depreciation

Corporation	Increase in depreciation--					
	Resulting from new guidelines		Per dollar of depreciable assets		Per dollar of total receipts	
	Percent	Amount (based on 1959)	Percent	Percent of 1946-59 total rise in rate	Percent	Percent of 1946-59 total rise in rate
		Mil. dol.				
All industries	14	2,868	0.7	26	0.4	27
Food and kindred products	14	104	.9	34	.2	28
Retail food 1/	11	29	1.0	31	.1	23
Beverage manufacturing	7	13	.4	25	.2	13
Tobacco manufacturing	10	3.5	.6	17	.1	15
Textile-mill products	14	43	.8	34	.3	26

1/ Percentage increase estimated to be the same as all retail and wholesale trade.

Source: Effects of New Guideline Lives (25, tables 2 and 4) and Statistics of Income (22, 1959-60).

27/ Computed class life $\frac{\sum_i C_i}{\sum_i [(C_i - S_i)/L_i]}$, where C_i is cost, S_i is estimated salvage, and L_i is the estimated service life of the i th depreciable asset in the class. By taking out salvage before dividing equivalent straight-line depreciation into total cost, the computed class life is raised (imputing life to salvage). Since justification of individual service lives is based on comparison of the computed class life with the guidelines, average lives can be shortened by an equivalent amount. Property depreciated only part of the year is included in the computation as part of the total cost so undue weight is given to new assets. New assets contain a disproportionate share of short-lived assets.

In terms of depreciation per dollar of depreciable assets, the expected increase amounts to a whole percentage point for retail food. Food and kindred products and textile mills also exceed the 0.7 percent increase in rate of asset write-off expected for the all-industry average (table 11). These increases not only will extend but accentuate the uptrend in postwar rate of write-off shown in figure 3. The expected rises resulting from the new guidelines equal one-sixth to one-third of the total increase in write-offs that took place between 1946 and 1959 in the industries studied.

A similar impetus is given to depreciation per dollar of total receipts (table 11). In these terms, the all-industry average exceeds each of the agricultural industries. Reference to figure 1 shows that these increases are sizable in relation to past trends (one-eight to one-fourth of the total 1946-59 rise), but somewhat less than the effects on write-off (except for the all-industry average).

It is problematical if the adoption of new guideline service lives will be as complete or as rapid as these estimates suggest. A slower transition will stretch out the effects on depreciation rates but may not detract from their total impact over time. It also remains to be seen whether investment policies will be changed so that implementation of the reserve ratio requirement will not force the increase of class lives and resultant decrease in depreciation rates. 28/ However, the reserve ratio test will not be applied for 3 years, or for a replacement cycle for a new taxpayer, or for new classes of property. It is advantageous for a taxpayer who is going to adopt the new lives to do so immediately so that a historical base can be established in meeting the test in the future. But, the "transition rule" provides that movement toward the acceptable range will satisfy the general rule for the period of one service life. So, immediate adoption of the new service lives is not imperative and may, in view of adverse profit effects, be adopted gradually as has been the adoption of rapid methods.

Investment Tax Credit

The Revenue Act of 1962 allowed credit on income tax based on a percentage of cost of mostly tangible personal property bought after January 1, 1962. A 7-percent credit (3 percent for utilities) was allowed for assets with service lives of 8 years or more. Credit was allowed on two-thirds of the cost of assets with 6- to 8-year lives and one-third for assets with 4- to 6-year lives. A $50,000 limit was placed on used assets qualifying for the credit. The maximum credit in any one year amounts to $25,000 plus 25 percent of the previously computed tax bill of a firm. Five-year carry forward and, in the future, 3-year carry back provisions will smooth out the effects on profits of large purchases in specific years.

Use of the investment credit is expected to reduce annual profits in all industries by roughly $1 billion. This effect is somewhat less than the adoption of the new guideline service lives. The reduction in profits for the food and kindred products

28/ The reserve ratio test is a comparison of depreciation reserve ratios by guideline classes and methods of depreciation. The test tables are calibrated in terms of rates of growth by class lives. The purpose of the test is to compare investment policies of a going business with its retirement policy. Leniency is built into the test by giving ranges of acceptability based on assets held between an average of 20 percent longer and 10 percent shorter than its test life. In addition, a rising price level works in favor of satisfying the reserve ratio test. Rules are provided so that class lives can be either increased or decreased if a class of assets consistently falls outside of the range given by the test tables.

industry may reach $30 million a year, equal to about 3 percent of profits after taxes reported in 1959.

The primary purpose of the investment credit is to stimulate purchases of new equipment and thereby enhance economic growth of the economy. By applying a credit directly to taxes, the effect of a given loss of revenue would be greater than by allowing a stepped-up rate of depreciation. The original proposal was to divorce investment credit from depreciation entirely. However, in so doing depreciation plus the tax credit would have exceeded cost of the equipment. To overcome this objection, legislation provided that the amount of the tax credit must be deducted from the total depreciation base.

The economic impact of the tax credit can best be visualized as a sliding scale reduction in price of equipment. Since the credit is applied after rather than before taxes are deducted, it has the influence of a credit twice as large for a firm being taxed at a 50-percent rate. In essence, equipment (with 8-year or longer service life) can now be purchased with about "86-cent dollars" by a firm in the 52-percent tax bracket. The price advantage is even greater for small firms taxed at the 30-percent rate. Their purchases can now be made with "77-cent dollars."

These 14 and 23 percent price advantages must be discounted, however, to account for the reduction in base of depreciable assets. This reduction in advantage will not amount to the full rate of the credit. The offset amounts to only the present value of 7 percent of purchases received at some time in the future. This present value depends on the method of depreciation and length of life of the asset in question. The longer the life and slower the method used, the lower will be the present value of the 7 percent so the greater will be the price advantage of the tax credit. Since short-lived equipment does not qualify for the tax credit, the value of the deduction from depreciable assets will tend to be small compared with the price advantage obtained.

Reducing the effective price of machinery and equipment is expected to increase purchases. The amount of the rise depends on the demand and supply schedules of these goods. 29/ The increase in purchases is expected to stimulate industrial production. This "feedback" is counted upon by the Treasury to offset, over a period of time, a large part of the loss in revenue resulting from the tax credit.

Since the tax credit will be substracted from depreciable assets, its affect on current depreciation will tend to offset that of using the new service guideline lives. Use of new guidelines is expected to increase depreciation nearly three times as much as the base of depreciable assets will be reduced. The reduced base will reduce current year depreciation by perhaps one-fifth to one-tenth, depending on the rate of write-off. On balance, the upward thrust given to rates of depreciation will approach the estimates given for the new guidelines alone (table 11). The depressing effects of the tax credit are probably within the range of error of the estimates for the new guidelines alone.

29/ A decline in price will move a firm down its demand schedule resulting in an increase in quantity demanded at the lower effective price. The increase will depend of the slope of the demand and supply schedules. The aggregate supply function is relatively elastic, the increase in quantity will be large relative to the associated pressure for a price rise in reaching a new equilibrium.

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APPENDIX: RAPID METHODS OF DEPRECIATION

Estimates were made of the amount of depreciation in 1959 that was the result of using rapid methods of depreciation in lieu of the straight-line method. These estimates were based on the proportion of depreciation that was charged off employing rapid methods. Comparisons were made of various methods of depreciation in terms of present net service value over time, showing deterioration and interest factors implied by each. Then, deferred tax accounts were analyzed. Their use arises from the practice of various corporations using rapid methods in computing depreciation for tax purposes but using the straight-line methods for financial purposes.

Depreciation Charges Above Straight-Line Method

Figure 10 shows the relation that exists between the proportion of annual depreciation charged off using the sum-of-the-years' digits method (SOYD) and the percentage that total depreciation, representing a mixture of the two methods, is above the comparable straight-line amount. SOYD is usually the most rapid method authorized by the 1954 Code, so the maximum effect of all rapid methods were estimated by this relationship.

The association between the two percentages varies depending on the annual change in new purchases and variations in asset service lives. The variation is not large during the first half of the switch over to using rapid methods, but fans out later. When all assets are depreciated by the rapid method, depreciation returns to the same level as existed under the straight-line method, if new purchases remain at a constant rate. But, if new purchases are continually rising, adoption of rapid

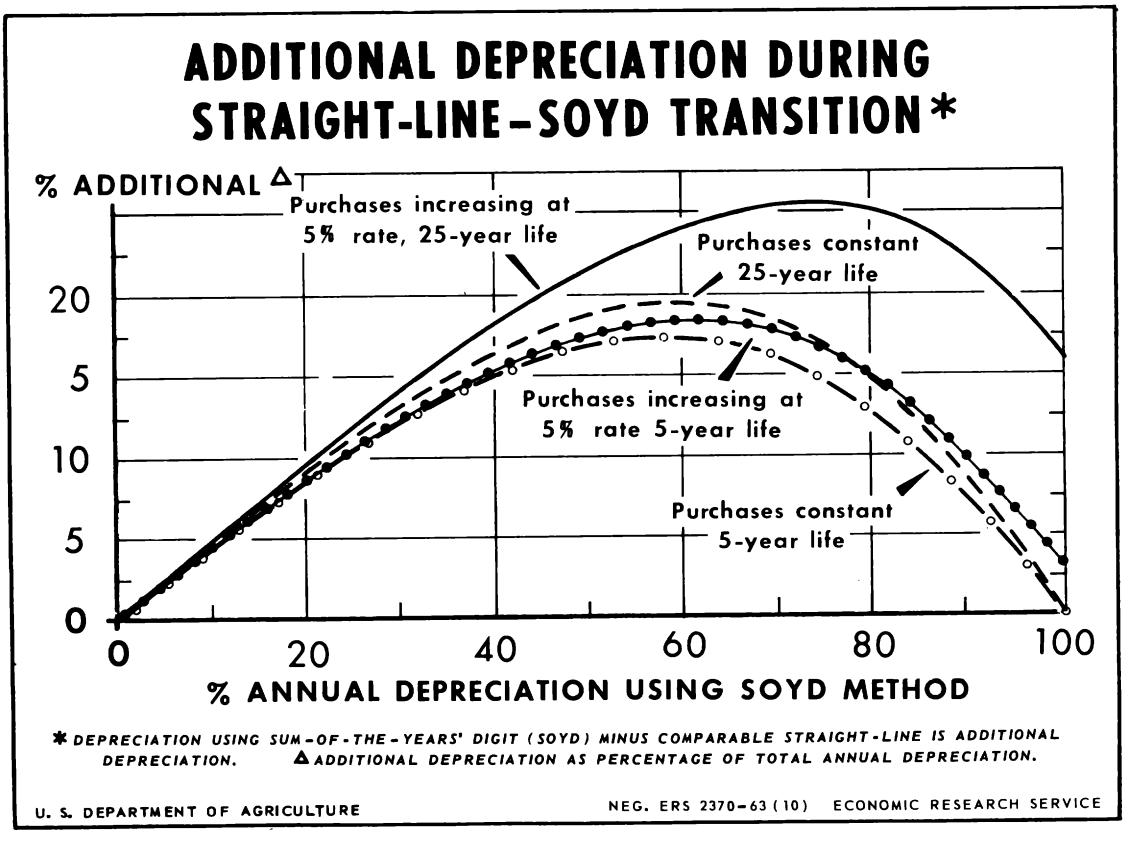

Figure 10

methods will have a lasting influence. In both cases during the switch over to using rapid methods, total depreciation rises substantially but recedes somewhere after the midpoint of conversion is passed.

The proportion of depreciation obtained by using rapid methods is given in table 4 for corporations in each industry. The range of increase in new purchases used in figure 10, between no rise and 5 percent annually, probably covers most agricultural industries. 30/ Possibly tobacco manufacturing and retail food exceeded the 5-percent rate of increase but others fell short of it. Estimates of asset service lives were obtained from table 8. Reference to figure 10 shows that the 37 percent of annual depreciation taken under declining-balance and SOYD methods in 1959 by the all-industry average is equivalent to about 15 or 16 percent of total annual depreciation charges. The estimates for corporations in industries that market agricultural products are as follows:

Industry	Percent of annual depreciation in 1959 attributed to use of rapid methods
Food and kindred products	16-17
Retail food	15-16
Beverage manufacturing	16-17
Tobacco manufacturing	20-22
Textile-mill products	15-16

Implications of Rapid Methods

A decline in net service value from the use of an asset results when there is a decline in annual output or when a constant outflow of value is forthcoming but repair costs are rising. The combination of factors associated with age debility can be

30/ A 5-percent annual rise in new purchases implies current investment exceeds annual depreciation by 78 percent over using the straight-line method on 25-year assets. While switching to using the SOYD method, this excess is reduced to a minimum of about 26 percent midway in the conversion and to 30 percent when all assets are under the new method. A 10-year asset with a 5-percent annual rise in new purchases implies a 24-percent excess of current investment over annual depreciation using the straight-line method. This reduces to slightly below equality in converting to the SOYD method and upon conversion remains 15 percent above depreciation.

Annual purchases of privately owned structures and equipment in all manufacturing establishments increased 68 percent between 1946 and 1959 (21, table 9, pp. 28-29). It reflects a 4.1 percent annual average rate of increase. Investment in 1959 exceeded depreciation (as reported by Statistics of Income) by 15 percent. A total of 1,819 publicly held manufacturing firms reported plant and equipment expenditures for 1959 exceeded depreciation (including amortization and depletion) by 43 percent (17). The industries in this group that market agricultural products had expenditures exceeding depreciation: Food and kindred products, 54 percent; beverage manufacturing, 61 percent; textile-mill products, 25 percent; and tobacco manufacturing, 114 percent. These data being publicly reported, probably reflected use of the straight-line method.

The Bureau of Census reported 1958 capital expenditures by retail food establishments operated by corporations totaled $484 million (20, table 2, p. 6). Of this total, $448 million was for new facilities. The total is double the $238 million for depreciation reported by IRS.

termed a deterioration factor. It is expected to vary widely from one asset to another and over time, but nevertheless, to exist as a function of time. Straight-line depreciation fails to recognize the existence of a deterioration factor. Its use assumes a constant net service value over time.

The market for used equipment perhaps is the best measure of the deterioration factor. This market reflects declining physical service, declining economic service, and changing demands for the asset's services. Such changes in demand may be hastened by technological innovations. Unfortunately for economic analysis, there are relatively few organized markets for used assets. This makes measuring deterioration factors difficult.

Time preference results in a higher valuation being placed on services immediately performed than on those performed in the distant future. The cost of an asset embodies the present value of all future returns. If future returns are worth less to the purchaser than current returns, the imputed cost of capital yielding future returns is less. Declining value of future services is a function of the present value of money, so future returns are discounted at an interest rate appropriate to the firm. Declining present value over time of a constant net service value can be termed an interest factor.

The various depreciation methods with several different rates of deterioration and interest are compared in table 12. Cumulating the annual asset write-off shows that for a 20-year asset the double-declining-balance method of depreciation writes off value at a rate somewhat slower than a 5-percent depreciation factor combined with a 6-percent interest factor. The sum-of-years' digits method is somewhat more rapid than the declining-balance method (15). The SOYD trails the cumulative write-off of the 5 percent plus 6 percent combination during the first 9 years, but then exceeds it during the remaining 11 years. Using rapid methods on an asset with a shorter service life reflects higher interest and deterioration rates: A 10-year asset depreciated by the sum-of-years' digits assumes somewhat more than a 12-percent combined rate of interest and deterioration, but the double-declining-balance method implies nearly a 20-percent combined rate.

Rapid methods of depreciation sometimes are defended for correcting for the underdepreciation caused by rising price levels. Rapid rates will tend to compensate for actual capital consumption exceeding allowable depreciation during inflation. But at best their use would be a crude approximation to the problems of inflation and would tend to aggravate the overdepreciation that occurs during deflation. Price-level problems are better treated directly, if desired by public policy, by adjusting asset values in terms of current prices. Use of rapid methods can better be justified in terms of interest and deterioration factors.

Perpetually Deferred Taxes

The effect of a change from depreciating an asset by the straight-line method to a more rapid method is to increase the depreciation charge in the early years of use of an asset while lowering the charge in later years. The total amount of dollars charged off during the life of the asset remains unchanged, as does the number of years over which depreciation is charged.

When a switch is made to more rapid methods, as was authorized in the 1954 Revenue Code, a substantial increase in depreciation charges and reduction in taxes and profits results for a few years while new assets are being shifted onto the new

Table 12.--Comparisons of depreciation rates for an asset with 20-year life

Year	Straight-line	Sum-of-the-years' digits	Double-declining-balance	D.F. 0% I.F. 6%	D.F. 0% I.F. 12%	D.F. 0% I.F. 20%	D.F. 5% I.F. 6%	D.F. 5% I.F. 20%	D.F. 10% I.F. 20%
	Percent annual depreciation			Percent annual depreciation					
1	5	10	10	8	12	17	12	21	25
2	5	9	9	8	11	14	10	17	19
3	5	9	8	7	9	12	9	13	14
4	5	8	7	7	9	10	8	10	11
5	5	7½	7	7	8	8	8	8	8
6	5	7	6	6	7	7	7	6	6
7	5	7	5	6	6	6	6	5	4
8	5	6	5	5	5	5	5	4	3
9	5	6	4	5	5	4	5	3	3
10	5	5	4	5	4	3	4	3	2
11	5	5	3½	5	4	3	4	2	1
12	5	4	3½	4	3	2	4	2	1
13	5	4	3½	4	3	2	3	1	1
14	5	3	3½	4	3	2	3	1	½
15	5	3	3½	4	2	1	3	1	½
16	5	2	3½	3	2	1	2	1	½
17	5	2	3½	3	2	1	2	1	¼
18	5	1	3½	3	2	1	2	½	¼
19	5	1	3½	3	2	½	2	½	0
20	5	½	3½	3	1	½	1	0	0

D.F. = deterioration factor
I.F. = interest factor

Source: Adapted from Dixon, (7, p. 595).

method. Once the shift is completed, depreciation, taxes, and profits of a firm as a whole return to their old levels if there is a constant rate of new purchases. (Purchases will equal depreciation.) Taxes and profits never exceed the old level to "make up" for the period of reduction as long as assets continue to be replaced at a constant rate and the tax rate unchanged. When all assets are being depreciated on the new basis, new assets depreciating at a rapid rate will be offset by older assets depreciating at a reduced rate (assuming no price-level changes).

To avoid a decline in profits during the switch to rapid methods, firms often set up deferred taxes accounts in financial reports while letting profits drop in tax accounts. But, if a deferred tax account were established in the case of a firm with no increase in purchases over time, the account would rise during the transition and then continue on a plateau as long as the firm's investment policy did not change.

The hypothetical firm in table 6 shows depreciation rising by $300 in the second and third years after switching from straight-line to the sum-of-the-years' digits method. By the fifth year, the last year of the assumed average service life of the assets, depreciation, taxes, and profits all have returned to the level under the straight-line method. If a deferred tax account were established, it would rise to $500 by the fourth year and continue at this level indefinitely.

In the hypothetical firm expanding at a rate of 5 percent per year, the proportion of new assets continues to outweigh older assets (table 7). On balance, depreciation, taxes, and profits never return to their previous levels. Depreciation due to switching to rapid methods hits its peak in the third year after the transition. By the fifth year, a trough is reached from which a gradual ascent is begun. A deferred tax account continues to increase as long as investment exceeds depreciation. If table 7 were extended, depreciation due to rapid methods would reach $144 in year 20 and $233 in year 30. 31/ "Deferred" taxes in these examples is a misnomer. An income tax liability exceeding that due under straight-line depreciation will never arise, under current tax laws unless a firm begins to disinvest, and then only if it remains a profitable firm.

In the hypothetical firm in table 7 assume income before depreciation, charges and income taxes in year 1 totaled $5,000. Stockholder and tax reports following

31/ Additional depreciation can be calculated for a year from the following general formula assuming a uniform service life (n), a constant rate of growth (r), and an initial investment of X:

$$y = \Sigma\left[X(1+r)^{y}\left(\frac{n}{1/2n(n+1)} - \frac{1}{n}\right)\right] + \left[X(1+r)^{y-1}\left(\frac{n-1}{1/2n(n+1)} - \frac{1}{n}\right)\right] +$$

$$\ldots\ldots + \left[X(1+r)^{y-(n-1)}\left(\frac{n-(n-1)}{1/2n(n+1)} - \frac{1}{n}\right)\right].$$

Based on Davidson (5).

straight-line and sum-of-the-years' digits methods, respectively, will differ as follows:

	Stockholder report	Tax report
Cash income	$5,000	$5,000
Depreciation charges	1,500	1,700
Income before tax	3,500	3,300
Income taxes (at 52 percent)		
Taxes paid	1,716	1,716
Deferred taxes	104	0
Income after taxes	1,680	1,584

Taxes paid remains the same in the two accounts. The $200 more depreciation in the tax report saves $104 in taxes, which goes to the deferred tax account, and reduces income by $96. The deferred tax account allows a firm to take advantage of the reduction in taxes afforded by rapid methods of depreciation while at the same time keeping profits reported to stockholders at a higher level based on straight-line depreciation. The question of which account more accurately represents the true financial picture of a firm or industry depends upon the present net service of the assets involved.

The possibility of future declines in tax rates raises a further question about the amount of taxes that are deferred. Presumably these accounts all will need to be discounted on the basis of any reduction in rates actually adopted.

Table 13.--All industrial corporations: Selected financial data, 1939-59

Item	1939	1940	1946	1947	1948	1949	1950	1951
	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.
Total assets	306,801	320,478	444,705	494,615	525,136	543,562	598,369	647,524
Gross depreciable assets 1/	129,189	130,685	148,968	163,744	180,562	195,024	209,098	227,882
Reserve for depreciation	39,237	40,524	57,421	60,664	64,225	68,988	74,283	78,787
Net depreciable assets	89,952	90,161	91,547	103,080	116,337	126,036	134,815	149,095
Total compiled receipts	130,365	145,427	283,917	361,521	405,430	387,636	452,523	511,849
Depreciation 2/	3,805	3,931	4,972	6,383	7,939	8,521	9,489	11,090
Profits, before income tax	7,236	9,472	25,025	31,207	34,248	28,130	42,535	43,495
Profits, after income tax	6,019	6,947	16,315	20,420	22,477	18,442	25,367	21,593
Retained earnings 3/	380	1,109	8,937	12,135	13,172	8,978	13,896	10,374
Total cash flow 4/	9,824	10,878	21,287	26,803	30,416	26,963	34,856	32,683
Stockholder's equity 5/	136,863	138,386	164,614	180,567	197,220	208,297	223,608	239,037
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Depreciation as percent of:								
Total compiled receipts	2.92	2.70	1.75	1.77	1.96	2.20	2.10	2.17
Gross depreciable assets	2.95	3.01	3.34	3.90	4.40	4.37	4.54	4.87
Stockholder's equity	99.10	89.90	52.50	45.30	44.50	50.30	46.20	44.50
Gross depreciable assets as percent of total compiled receipts	4.62	4.78	5.75	5.65	5.54	4.76	5.61	4.22
Profits (after income tax) as percent of:								
Total compiled receipts	7.54	7.48	7.50	7.41	7.50	6.96	7.70	6.39
Stockholder's equity	2.78	2.84	3.02	3.53	4.03	4.09	4.24	4.64
Total cash flow as percent of:								
Total compiled receipts	4.40	5.02	9.91	11.3	11.4	8.85	11.30	9.03
Stockholder's equity	7.18	7.86	12.90	14.80	15.40	12.90	15.60	13.70
	1952	1953	1954	1955	1956	1957	1958	1959
	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.
Total assets	721,861	761,877	805,300	881,621	948,951	996,400	1,064,481	1,136,668
Gross depreciable assets 1/	243,859	260,460	275,855	302,641	330,654	356,911	385,640	412,243
Reserve for depreciation	84,283	90,403	97,036	107,980	117,799	128,563	141,605	153,730
Net depreciable assets	159,576	170,057	178,819	194,661	212,855	228,348	244,035	258,513
Total compiled receipts	525,011	551,984	547,001	634,508	673,493	714,280	728,247	816,800
Depreciation 2/	12,433	14,178	15,729	18,591	20,467	22,609	23,642	25,299
Profits, before income tax	38,507	39,582	36,486	47,601	47,184	44,912	39,063	47,655
Profits, after income tax	19,505	19,889	19,804	26,065	25,962	24,446	20,404	25,130
Retained earnings 3/	8,309	8,356	7,973	12,597	11,603	9,643	5,518	8,888
Total cash flow 4/	31,938	34,067	35,533	44,656	46,429	47,055	44,046	50,429
Stockholder's equity 5/	254,007	265,181	278,499	305,449	327,668	344,350	369,157	389,004
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Depreciation as percent of:								
Total compiled receipts	2.37	2.57	2.88	2.93	3.04	3.17	3.25	3.10
Gross depreciable assets	5.10	5.44	5.70	6.14	6.19	6.33	6.13	6.14
Stockholder's equity	46.40	47.20	50.40	47.70	49.10	50.00	53.00	50.40
Gross depreciable assets as percent of total compiled receipts	3.72	3.60	3.62	4.11	3.85	3.42	2.80	3.08
Profits (after income tax) as percent of:								
Total compiled receipts	6.08	6.17	6.50	7.04	6.89	6.59	6.05	6.17
Stockholder's equity	4.89	5.35	5.65	6.09	6.25	6.57	6.40	6.50
Total cash flow as percent of:								
Total compiled receipts	7.68	7.50	7.11	8.53	7.92	7.10	5.53	6.46
Stockholder's equity	12.60	12.80	12.80	14.60	14.20	13.70	11.90	12.96

1/ Includes depletable and intangible assets. 2/ Includes amortization and depletion. 3/ Profits after income tax less cash dividends paid. 4/ Sum of depreciation, amortization, depletion and profits after income tax. 5/ Includes capital stock, surplus, and reserves.

Source: Firms reporting balance sheets to Internal Revenue Service (22).

Table 14.--Food and kindred products corporations (less beverages): Selected financial data, 1939-59

Item	1939	1940	1946	1947	1948	1949	1950	1951
	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.
Total assets	5,581	5,989	8,653	9,742	10,121	10,288	11,621	12,467
Gross depreciable assets 1/	3,450	3,752	4,435	5,047	5,530	5,879	6,504	6,886
Reserve for depreciation	1,465	1,659	2,047	2,177	2,278	2,430	2,642	2,814
Net depreciable assets	1,985	2,093	2,388	2,870	3,252	3,449	3,862	4,072
Total compiled receipts	10,056	10,531	22,947	30,176	31,292	29,569	31,353	35,725
Depreciation 2/	136	145	171	216	257	292	314	350
Profits, before income tax	389	409	1,508	1,385	1,106	1,065	1,368	1,170
Profits, after income tax	321	311	937	854	665	641	707	549
Retained earnings 3/	82	67	611	474	308	287	333	174
Total cash flow 4/	457	456	1,108	1,070	922	933	1,021	899
Stockholder's equity 5/	4,222	4,485	6,060	6,591	6,882	7,118	7,748	8,035
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Depreciation as percent of:								
Total compiled receipts	1.35	1.38	0.75	0.71	0.82	0.99	1.00	0.98
Gross depreciable assets	3.94	3.86	3.85	4.26	4.65	4.97	4.83	5.08
Stockholder's equity	34.30	35.60	19.33	16.70	17.70	19.90	20.70	19.30
Gross depreciable assets as percent of total compiled receipts	3.19	2.95	4.08	2.83	2.13	2.17	2.25	1.54
Profits (after income tax) as percent of:								
Total compiled receipts	4.54	4.33	4.83	3.55	2.95	3.16	3.26	2.52
Stockholder's equity	3.22	3.23	2.82	3.28	3.73	4.10	4.05	4.36
Total cash flow as percent of:								
Total compiled receipts	7.60	6.93	15.50	13.00	9.66	9.01	9.12	6.83
Stockholder's equity	10.80	10.20	18.30	16.20	13.40	13.10	13.20	11.20

	1952	1953	1954	1955	1956	1957	1958	1959
	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.
Total assets	12,570	12,529	12,929	13,845	14,296	14,454	16,813	18,010
Gross depreciable assets 1/	7,131	7,164	7,535	8,089	8,358	8,793	10,667	11,412
Reserve for depreciation	2,978	3,100	3,317	3,574	3,715	4,008	4,990	5,416
Net depreciable assets	4,153	4,064	4,218	4,515	4,643	4,785	5,677	5,996
Total compiled receipts	35,772	35,631	36,553	37,999	38,302	40,422	48,308	50,479
Depreciation 2/	369	391	425	485	491	538	690	750
Profits, before income tax	1,135	1,260	1,213	1,482	1,423	1,370	1,603	1,747
Profits, after income tax	506	579	575	725	700	653	801	847
Retained earnings 3/	159	172	221	346	310	246	380	418
Total cash flow 4/	875	970	1,000	1,210	1,191	1,191	1,491	1,597
Stockholder's equity 5/	8,247	8,239	8,410	9,007	9,092	9,345	10,633	11,140
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Depreciation as percent of:								
Total compiled receipts	1.03	1.10	1.16	1.28	1.28	1.33	1.43	1.49
Gross depreciable assets	5.17	5.46	5.64	6.00	5.87	6.12	6.47	6.57
Stockholder's equity	19.90	20.10	20.60	21.30	21.80	21.80	22.10	22.61
Gross depreciable assets as percent of total compiled receipts	1.41	1.62	1.57	1.91	1.83	1.62	1.66	1.68
Profits (after income tax) as percent of:								
Total compiled receipts	2.45	2.72	2.74	3.18	3.11	2.95	3.09	3.16
Stockholder's equity	4.47	4.75	5.05	5.38	5.40	5.76	6.49	6.73
Total cash flow as percent of:								
Total compiled receipts	6.14	7.03	6.84	8.05	7.70	6.99	7.53	7.60
Stockholder's equity	10.60	11.80	11.90	13.40	13.10	12.70	14.00	14.34

1/ Includes depletable and intangible assets. 2/ Includes amortization and depletion. 3/ Profits after income tax less cash dividends paid. 4/ Sum of depreciation, amortization, depletion, and profits after income tax. 5/ Includes capital stock, surplus, and reserves.

Source: Firms reporting balance sheets to Internal Revenue Service (22).

Table 15.--Retail food corporations: Selected financial data, 1939-59

Item	1939	1940	1946	1947	1948	1949	1950	1951
	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.
Total assets	969	1,047	1,742	1,910	2,054	2,211	2,642	2,892
Gross depreciable assets 1/	500	594	642	796	933	1,052	1,235	1,390
Reserve for depreciation	231	251	297	330	342	384	422	487
Net depreciable assets	269	343	345	466	591	668	813	903
Total compiled receipts	3,604	4,037	8,027	10,400	11,949	12,101	13,415	15,732
Depreciation 2/	37	40	39	52	66	80	91	108
Profits, before income tax	57	57	269	257	254	289	320	278
Profits, after income tax	46	42	170	160	157	179	178	131
Retained earnings 3/	4	5	125	106	103	123	113	61
Total cash flow 4/	83	82	209	212	223	259	269	239
Stockholder's equity 5/	658	708	970	1,105	1,251	1,374	1,559	1,700
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Depreciation as percent of:								
Total compiled receipts	1.02	0.99	0.49	0.50	0.55	0.66	0.68	0.69
Gross depreciable assets	7.32	6.73	6.07	6.53	7.07	7.60	7.37	7.77
Stockholder's equity	13.90	14.70	8.00	7.70	7.80	8.70	9.20	8.80
Gross depreciable assets as percent of total compiled receipts	1.27	1.04	2.12	1.54	1.31	1.48	1.33	.83
Profits (after income tax) as percent of:								
Total compiled receipts	2.29	2.03	2.60	2.04	1.87	2.14	2.01	1.52
Stockholder's equity	5.56	5.65	4.02	4.71	5.28	5.82	5.84	6.35
Total cash flow as percent of:								
Total compiled receipts	6.98	5.93	17.50	14.50	12.50	13.00	11.40	7.71
Stockholder's equity	12.50	11.60	21.50	19.20	17.80	17.30	14.10	14.10
	1952	1953	1954	1955	1956	1957	1958	1959
	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.
Total assets	3,202	3,397	3,685	4,296	4,998	5,247	4,773	5,186
Gross depreciable assets 1/	1,561	1,655	1,809	2,156	2,829	3,006	2,497	2,796
Reserve for depreciation	591	647	734	879	1,194	1,282	1,023	1,135
Net depreciable assets	970	1,008	1,075	1,277	1,635	1,724	1,474	1,611
Total compiled receipts	17,633	18,657	19,757	22,168	24,955	27,528	26,531	28,477
Depreciation 2/	124	134	153	189	233	279	238	264
Profits, before income tax	324	376	402	449	525	548	521	532
Profits, after income tax	150	176	199	221	257	265	258	261
Retained earnings 3/	72	100	118	131	157	156	155	146
Total cash flow 4/	274	310	352	410	490	544	496	525
Stockholder's equity 5/	1,862	1,948	2,130	2,365	2,684	2,789	2,521	2,695
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Depreciation as percent of:								
Total compiled receipts	0.70	0.72	0.77	0.85	0.93	1.01	0.90	0.93
Gross depreciable assets	7.94	8.10	8.46	8.77	8.24	9.28	9.53	9.44
Stockholder's equity	8.90	8.90	9.20	9.70	11.30	10.90	9.40	9.80
Gross depreciable assets as percent of total compiled receipts	.85	.94	1.01	1.00	1.03	.96	.97	.92
Profits (after income tax) as percent of:								
Total compiled receipts	1.55	1.66	1.78	1.85	1.96	1.98	1.87	1.84
Stockholder's equity	6.66	6.88	7.18	7.99	8.68	10.00	9.44	9.80
Total cash flow as percent of:								
Total compiled receipts	8.06	9.03	9.34	9.34	9.58	9.50	10.20	9.68
Stockholder's equity	14.70	15.90	16.50	17.30	18.30	19.50	19.70	19.48

1/ Includes depletable and intangible assets. 2/ Includes amortization and depletion. 3/ Profits after income tax less cash dividends paid. 4/ Sum of depreciation, amortization, depletion and profits after income tax. 5/ Includes capital stock, surplus, and reserves.

Source: Firms reporting balance sheets to Internal Revenue Service (22).

Table 16.--Beverage manufacturing corporations: Selected financial data, 1939-59

Item	1939	1940	1946	1947	1948	1949	1950	1951
	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.
Total assets	1,284	1,347	2,577	2,855	3,240	3,270	3,564	3,922
Gross depreciable assets 1/	743	815	1,124	1,282	1,517	1,633	1,748	1,987
Reserve for depreciation	251	271	445	440	482	524	575	660
Net depreciable assets	492	544	679	842	1,035	1,109	1,173	1,327
Total compiled receipts	1,687	1,811	4,762	4,920	5,277	5,426	5,534	6,903
Depreciation 2/	37	38	52	63	74	84	87	103
Profits, before income tax	135	135	499	458	464	434	461	448
Profits, after income tax	109	100	303	272	277	263	257	206
Retained earnings 3/	36	33	206	158	169	155	148	94
Total cash flow 4/	146	138	355	335	351	347	344	309
Stockholder's equity 5/	836	866	1,605	1,727	1,929	2,068	2,211	2,445
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Depreciation as percent of:								
Total compiled receipts	2.19	2.12	1.09	1.28	1.40	1.55	1.57	1.49
Gross depreciable assets	4.98	4.71	4.63	4.91	4.88	5.14	4.98	5.18
Stockholder's equity	44.00	45.00	23.60	26.10	28.70	30.10	31.60	28.80
Gross depreciable assets as percent of total compiled receipts	6.46	5.52	6.36	5.53	5.25	4.85	4.64	2.98
Profits (after income tax) as percent of:								
Total compiled receipts	8.65	7.64	7.45	6.81	6.65	6.40	6.22	4.48
Stockholder's equity	4.43	4.43	3.24	3.65	3.84	4.06	3.93	4.21
Total cash flow as percent of:								
Total compiled receipts	13.00	11.50	18.90	15.70	14.40	12.70	11.60	8.43
Stockholder's equity	17.50	16.00	22.10	19.40	18.20	16.80	15.60	12.60

	1952	1953	1954	1955	1956	1957	1958	1959
	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.
Total assets	4,035	3,863	4,098	4,140	4,118	4,387	5,054	5,249
Gross depreciable assets 1/	2,070	2,075	2,117	2,294	2,411	2,582	2,825	3,044
Reserve for depreciation	726	753	793	881	962	1,050	1,209	1,330
Net depreciable assets	1,344	1,322	1,324	1,413	1,449	1,532	1,616	1,714
Total compiled receipts	7,264	7,308	7,363	6,660	6,830	7,082	7,764	8,308
Depreciation 2/	115	109	123	136	145	159	178	194
Profits, before income tax	421	399	342	407	366	379	426	501
Profits, after income tax	183	180	153	198	167	182	211	249
Retained earnings 3/	64	59	32	83	82	77	90	117
Total cash flow 4/	298	289	276	334	312	341	389	443
Stockholder's equity 5/	2,539	2,478	2,545	2,661	2,671	2,857	3,206	3,311
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Depreciation as percent of:								
Total compiled receipts	1.58	1.49	1.67	2.04	2.12	2.25	2.29	2.34
Gross depreciable assets	5.56	5.25	5.81	5.93	6.01	6.16	6.30	6.37
Stockholder's equity	28.50	28.40	28.80	34.40	35.30	36.50	36.40	36.60
Gross depreciable assets as percent of total compiled receipts	2.52	2.46	2.08	2.97	2.45	2.57	2.72	3.00
Profits (after income tax) as percent of:								
Total compiled receipts	4.10	3.95	3.75	5.02	4.57	4.82	5.01	5.33
Stockholder's equity	4.53	4.40	4.83	5.11	5.43	5.57	5.55	5.86
Total cash flow as percent of:								
Total compiled receipts	7.21	7.26	6.01	7.44	6.25	6.37	6.58	7.52
Stockholder's equity	11.70	11.70	10.80	12.60	11.70	11.90	12.10	13.37

1/ Includes depletable and intangible assets. 2/ Includes amortization and depletion. 3/ Profits after income tax less cash dividends paid. 4/ Sum of depreciation, amortization, depletion and profits after income tax. 5/ Includes capital stock, surplus, and reserves.

Source: Firms reporting balance sheets to Internal Revenue Service (22).

Table 17.--Tobacco manufacturing corporations: Selected financial data, 1939-59

Item	1939	1940	1946	1947	1948	1949	1950	1951
	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.
Total assets	1,107	1,142	1,963	2,164	2,348	2,412	2,498	2,691
Gross depreciable assets 1/	178	247	266	298	321	343	296	312
Reserve for depreciation	89	90	108	111	113	122	126	132
Net depreciable assets	89	157	158	187	208	221	170	180
Total compiled receipts	1,320	1,412	2,619	2,843	3,007	3,227	3,193	3,379
Depreciation 2/	8	8	7	8	10	11	12	13
Profits, before income tax	128	140	172	192	239	258	287	292
Profits, after income tax	107	106	108	119	149	161	157	128
Retained earnings 3/	14	16	36	40	61	68	62	33
Total cash flow 4/	115	114	115	127	159	172	169	141
Stockholder's equity 5/	873	892	1,069	1,162	1,227	1,338	1,364	1,393
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Depreciation as percent of:								
Total compiled receipts	0.60	0.55	0.26	0.29	0.33	0.35	0.37	0.38
Gross depreciable assets	4.44	3.16	2.52	2.78	3.08	3.32	4.02	4.07
Stockholder's equity	13.50	17.50	10.20	10.50	10.70	10.60	9.30	9.20
Gross depreciable assets as percent of total compiled receipts	8.11	7.51	4.12	4.19	4.96	4.99	4.92	3.79
Profits (after income tax) as percent of:								
Total compiled receipts	8.70	8.06	4.38	4.48	5.28	5.34	5.29	4.16
Stockholder's equity	.90	.87	.63	.71	.81	.85	.87	.91
Total cash flow as percent of:								
Total compiled receipts	12.30	11.90	10.10	10.20	12.10	12.00	11.50	9.19
Stockholder's equity	13.16	12.80	10.73	10.96	12.95	12.88	12.38	10.10

	1952	1953	1954	1955	1956	1957	1958	1959
	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.
Total assets	2,768	2,830	2,896	2,910	2,988	3,080	3,129	3,306
Gross depreciable assets 1/	324	333	355	383	421	464	518	592
Reserve for depreciation	142	151	164	177	192	205	229	259
Net depreciable assets	182	182	191	206	229	259	289	333
Total compiled receipts	3,705	3,745	3,651	3,848	3,998	4,177	4,494	4,836
Depreciation 2/	14	15	17	20	22	25	29	35
Profits, before income tax	283	305	316	380	398	426	512	547
Profits, after income tax	123	133	151	183	191	205	246	262
Retained earnings 3/	26	36	49	79	73	80	105	112
Total cash flow 4/	137	148	168	203	214	230	275	297
Stockholder's equity 5/	1,473	1,517	1,556	1,640	1,701	1,765	1,883	2,036
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Depreciation as percent of:								
Total compiled receipts	0.37	0.40	0.45	0.51	0.56	0.61	0.64	0.73
Gross depreciable assets	4.23	4.47	4.68	5.17	5.34	5.45	5.54	5.98
Stockholder's equity	8.70	8.90	9.70	10.00	10.50	11.10	11.50	12.20
Gross depreciable assets as percent of total compiled receipts	3.32	3.55	4.14	4.76	4.78	4.91	5.47	5.42
Profits (after income tax) as percent of:								
Total compiled receipts	3.69	3.95	4.59	5.27	5.34	5.51	6.11	6.15
Stockholder's equity	.93	.98	1.07	1.21	1.32	1.43	1.52	1.74
Total cash flow as percent of:								
Total compiled receipts	8.35	8.77	9.70	11.20	11.20	11.60	13.10	12.90
Stockholder's equity	9.28	9.75	10.80	12.40	12.60	13.0	14.60	14.60

1/ Includes depletable and intangible assets. 2/ Includes amortization and depletion. 3/ Profits after income tax less cash dividends paid. 4/ Sum of depreciation, amortization, depletion and profits after income tax. 5/ Includes capital stock, surplus, and reserves.

Source: Firms reporting balance sheets to Internal Revenue Service (22).

Table 18.--Textile-mill products corporations: Selected financial data, 1939-59

Item	1939	1940	1946	1947	1948	1949	1950	1951
	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.
Total assets	3,230	3,359	5,690	6,597	7,416	7,277	8,425	9,037
Gross depreciable assets 1/	2,670	2,670	2,941	3,390	3,900	4,227	4,508	4,867
Reserve for depreciation	1,340	1,387	1,576	1,650	1,730	1,822	1,915	1,993
Net depreciable assets	1,330	1,283	1,365	1,740	2,170	2,405	2,593	2,874
Total compiled receipts	3,863	4,197	9,817	11,444	12,346	10,642	13,109	14,231
Depreciation 2/	90	88	98	119	146	168	184	203
Profits, before income tax	154	196	1,342	1,503	1,498	655	1,236	980
Profits, after income tax	121	140	825	935	927	388	700	448
Retained earnings 3/	49	61	605	670	635	161	446	204
Total cash flow 4/	211	228	923	1,054	1,073	556	884	651
Stockholder's equity 5/	2,489	2,638	4,185	4,873	5,552	5,636	6,170	6,446
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Depreciation as percent of:								
Total compiled receipts	2.33	2.10	1.00	1.04	1.18	1.58	1.40	1.43
Gross depreciable assets	3.37	3.30	3.33	3.51	3.74	3.97	4.08	4.17
Stockholder's equity	69.10	63.60	30.00	29.60	31.60	39.70	34.40	34.20
Gross depreciable assets as percent of total compiled receipts	3.13	3.34	8.40	8.17	7.51	3.65	5.34	3.15
Profits (after income tax) as percent of:								
Total compiled receipts	5.46	5.43	9.20	9.21	8.69	5.22	6.74	4.57
Stockholder's equity	3.62	3.34	2.34	2.44	2.63	2.98	2.98	3.15
Total cash flow as percent of:								
Total compiled receipts	4.86	5.31	19.70	19.20	16.70	6.88	11.30	6.95
Stockholder's equity	8.48	8.64	22.10	21.60	19.30	9.87	14.30	10.10

	1952	1953	1954	1955	1956	1957	1958	1959
	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.
Total assets	8,484	8,487	8,623	9,399	9,470	9,065	8,539	8,929
Gross depreciable assets 1/	4,965	5,145	5,198	5,696	5,846	5,689	5,418	5,457
Reserve for depreciation	2,041	2,160	2,254	2,513	2,596	2,621	2,621	2,672
Net depreciable assets	2,924	2,985	2,944	3,183	3,250	3,068	2,797	2,785
Total compiled receipts	13,024	12,518	11,708	13,663	13,337	13,002	12,020	14,360
Depreciation 2/	217	237	253	283	303	319	304	311
Profits, before income tax	514	505	314	587	593	465	417	702
Profits, after income tax	198	193	90	264	284	212	205	364
Retained earnings 3/	12	20	-51	103	118	52	79	233
Total cash flow 4/	415	430	343	547	587	531	509	675
Stockholder's equity 5/	6,182	6,241	6,183	6,572	6,502	6,245	5,973	6,102
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Depreciation as percent of:								
Total compiled receipts	1.67	1.89	2.16	2.07	2.27	2.45	2.53	2.17
Gross depreciable assets	4.37	4.61	4.87	4.97	5.18	5.61	5.61	5.70
Stockholder's equity	38.10	41.10	44.40	41.70	43.80	43.80	45.10	38.00
Gross depreciable assets as percent of total compiled receipts	1.52	1.54	.77	1.93	2.13	1.63	1.71	2.53
Profits (after income tax) as percent of:								
Total compiled receipts	3.19	3.44	2.93	4.00	4.40	4.08	4.23	4.70
Stockholder's equity	3.51	3.80	4.09	4.31	4.66	5.11	5.09	5.10
Total cash flow as percent of:								
Total compiled receipts	3.20	3.09	1.46	4.02	4.37	3.39	3.43	5.97
Stockholder's equity	6.71	6.89	5.55	8.32	9.03	8.50	8.52	11.06

1/ Includes depletable and intangible assets. 2/ Includes amortization and depletion. 3/ Profits after income tax less cash dividends paid. 4/ Sum of depreciation, amortization, depletion and profits after income tax. 5/ Includes capital stock, surplus, and reserves.

Source: Firms reporting balance sheets to Internal Revenue Service (22).